

SCULPTURE AND THE VIRGIN | KOREA'S CULTURAL RICHES

ROTUNDA

volume 32: number 2
1999 fall/winter

The Enigmatic Hoatzin

*An odd bird finds its
phylogenetic home*

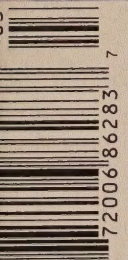
Dinosaur Ancestors

*Hunting for
evidence in the
desert of
Uzbekistan*

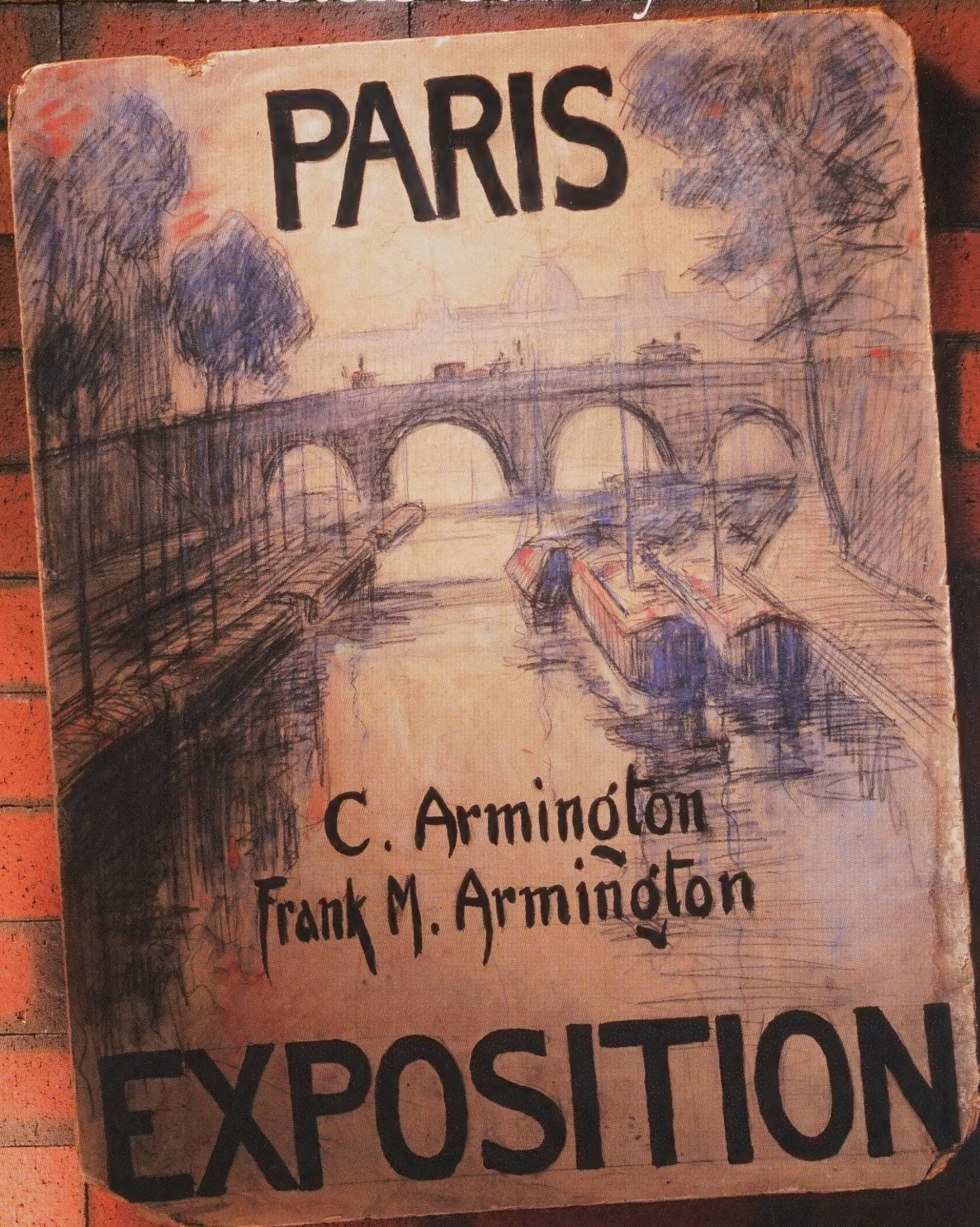
FALL | WINTER 1999

DISTRIBUTED BY CMPA \$4.25

THE MAGAZINE OF THE ROYAL ONTARIO MUSEUM



Masters Gallery Ltd.



Caroline and Frank Armington
"The Paris Exhibition"

Works from 1910 - 1925

Sale commencing October 21, 1999

815C 17TH AVENUE, S.W., CALGARY, ALBERTA T2T 0A1

PHONE: (403) 245-2064 • FAX: (403) 244-1636

C O N T E N T S

Volume 32, Number 2, Fall/Winter 1999

F E A T U R E S

16 The Enigmatic Hoatzin

Ornithologists have played classification hopscotch with this unusual bird for 200 years. At last, the definitive solution has been found.

By Janice Hughes

22 Sculpture and the Virgin

In Medieval Europe, the Virgin Mary commanded enormous popularity. Her many portrayals reflect the fashions and beliefs of the day.

By K. Corey Keeble

28 Hunting for Dinosaurs in Tamerlane's Backyard

The Kyzylkum Desert of Uzbekistan may yield the precursors of North American dinosaurs.

By Hans-Dieter Sues

34 The Essential Korea

Arts and technologies of Korea, from ancient to modern, are examined through highlights from the ROM's newly opened Gallery of Korean Art.

By Wonyoung Koh and Dr. Hugh Wylie

D E P A R T M E N T S

6 Explorations

Vomit spatulas and the Taino; coins of Kushan kings; the splendid thorny oyster; a mysterious Egyptian cosmetic cone

9 Growing Collections

Casting of Cannons in Edo, Japan by Klaas Ruitenbeek

11 Stargazing

Orion the Hunter by Ian McGregor

13 Backyard Biodiversity

The secret of garter snakes' success by Ross MacCulloch

43 Libris

Goddesses and Stars by Glen Ellis

45 ROM Answers

Identifying Mallorytown glass by Peter Kaelegren

49 Conservation Notes

Eastern and Western approaches to lacquer by Rowan Carter

52 From the Archives

Masked Ball in 1950s Toronto by Julia Matthews



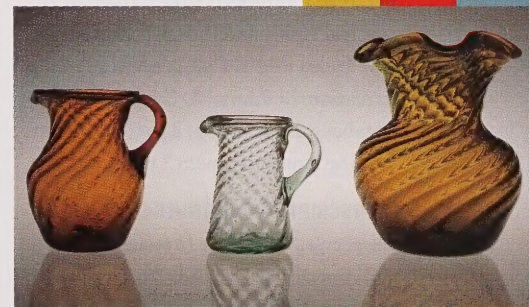
LIFE ON EARTH

28



PEOPLES OF CANADA

45



EARTH AND COSMOS

11



ROTUNDA

EXECUTIVE EDITOR

Sandra Piller

EDITOR

Lee-Anne Jack

CONSULTING EDITOR / BOOK REVIEWS

Glen Ellis

DESIGN AND PRODUCTION

Peter Enneson Design Inc.

PHOTOGRAPHY

Brian Boyle

CONTRIBUTING EDITORS

Peter Kaelgren, Susan Stock,

Cathy Ayley, Mark Engstrom,

Mary Burrige, Ian McGregor,

Julia Matthews

ADMINISTRATIVE ASSISTANT

Jennifer Little

ADVERTISING SALES

Sandra Piller, Executive Editor

(416) 586-5758

EDITORIAL AND MARKETING OFFICES

Rotunda, the magazine of the
Royal Ontario Museum, 100 Queen's
Park, Toronto, Ontario M5S 2C6,
or telephone (416) 586-5585,
fax (416) 586-5887
e-mail lee-anne@rom.on.ca
ROM Web site: www.rom.on.ca

Published three times per year by the
Royal Ontario Museum © The Royal On-
tario Museum, 1999. Printed and bound
in Canada. Indexed in the Canadian Pe-
riodical Index and the Canadian Maga-
zine Index and available on-line in the
Canadian Business & Current Affairs
Database ISSN 0035-8495. Canadian
Publications Agreement # 1460072

SUBSCRIPTIONS & SINGLE COPY SALES

Subscriptions \$11.97 (3 issues) plus 7%
GST, outside Canada add \$6 for postage
and handling; single copies \$4.25 plus
7% GST. All circulation and subscrip-
tion inquiries should be addressed to
Rotunda, Royal Ontario Museum, 100
Queen's Park, Toronto, Ontario M5S
2C6. Phone: (416) 586-5581, Fax: (416)
586-5887.

THE ROM GRATEFULLY ACKNOWLEDGES
THE LOUISE HAWLEY STONE
CHARITABLE TRUST FOR ITS GENEROUS
SUPPORT OF THIS PUBLICATION

EDITOR'S NOTE

LEE-ANNE JACK

THERE'S NOTHING LIKE curling up
with a good detective story on a
blustery autumn evening. ROM
curators and research associates pen a
surprising amount of excellent reading
material in this genre. They are adept at
solving mysteries—from uncovering
ancient and previously unknown civi-
lizations from the tiniest of potsherds
to piecing together the intricacies of the
natural world from bones and DNA. In
our cover story, research associate Jan-
ice Hughes combines comedy and dra-
ma in her account of the sleuth work
that finally clinched the classification
of an odd and elusive bird, the hoatzin.
This unusual South American native
had been bounced from one avian or-
der to another over the past 200 years.
Janice's combination of DNA sequenc-
ing and more traditional classification
methods that rely on physical features
finally solved the perplexing problem
and found a permanent home on the
phylogenetic tree for the hoatzin.



The mystery of the hoatzin's classification is
just one of many solved by ROM curators.

Halfway around the world, ROM
dinosaur hunter Dr. Hans-Dieter
Sues, who is also vice-president of
Collections and Research at the Muse-
um, is researching a mystery of his

own. He is hunting for clues to the an-
cestry of our North American di-
nosauers in the Kyzylkum Desert of
Uzbekistan. Scientists have hypothe-
sized that the dinosaurs of Alberta and
Montana originated in Asia and
crossed the land bridge that existed at
that time—some 90 million years ago—
to North America. In his tales from the
field, Dr. Sues tells of the hazards
along the road to gathering the neces-
sary evidence for his research.

Images of the Virgin Mary have
played a central role in Christianity
for centuries, but during the Middle
Ages she was particularly popular.
Mary served as an important model
for humanizing the Medieval world.
K. Corey Keeble, art historian in the
ROM's Department of Western Art
and Culture, outlines the various in-
carnations of the Madonna as repre-
sented in the Museum's European
collections. Particularly exciting is his
recent work that uncovered the iden-
tity of the sculptor of one of the Muse-
um's previously unattributed wooden
works. The sculpture of St. Anne, the
Virgin, and child is now believed to be
the work of German artist Claus Berg.

Distant lands and different cultures
often appeal to our sense of adventure.
But if you're not able to book the plane
ticket, reading about the culture, or
better yet visiting it at the ROM, is the
next best thing. Guest curator Wony-
oung Koh and Dr. Hugh Wylie of the
ROM's Department of Near Eastern
and Asian Civilizations have assem-
bled a brief guide to the essential ele-
ments of Korea's technological, cultur-
al, and art history, based on highlights
of the newly opened Gallery of Korean
Art. Sadly, just prior to the gallery's
opening, Dr. Wylie passed away. He
would have been proud of the visually
impressive space that showcases the
Museum's fine Korean collection.

I hope you enjoy the mysteries and
adventures in this issue of *Rotunda* and
wish you all the best for the holidays.

LINDSAY SHARP

THIS SUMMER I was truly inspired by a rare visit to one of the ROM's field sites. High above sea level, at 2300 metres, I was welcomed by curator Des Collins and his team of eight student paleontologists. Their base camp was set on Fossil Ridge, an area between Mount Field and Wapta Mountain (approximately 25 kilometers west of Banff, Alberta). There is a climb of 200 metres straight up that takes you to the site of the Burgess Shale quarry, which is perched on the side of a steep mountain slope. Des has spent 17 summers here and elsewhere in Yoho National Park digging for rare fossils.

Designated as a world heritage site in 1981, the Burgess Shale is known as the most important source of fossilized material from the Cambrian period, dating back more than 500 million years. The site contains some of the oldest and best-preserved specimens of early animal life anywhere in

imens from destruction.

During their work there each summer, researchers must overcome extreme conditions. This year, for example, they had to dig out 5 metres of snow before they could even begin hammering slabs of shale from the quarry. The area has one of the highest precipitation rates in Canada, and the group contends with rain approximately 50 per cent of the time, along with the occasional hail and snow storm. The temperature drops to below freezing most nights, and the crew doesn't begin to thaw out until sunlight makes its way to the quarry sometime around 11 a.m. (if they are lucky!). When it's time to replenish their supplies, members of the group hike down the mountain path to the nearest town 10 kilometres away and return three days later with heavy packs. The word "rugged" is simply an understatement.

The day I arrived, the temperature reached a high of 2 degrees Celsius by midday. I witnessed a dramatic manoeuvre as a Bell 407 helicopter landed on a perch no more than 10 metres wide on the side of the mountain. Approximately one ton of shale was carefully bundled into a large net slung under the helicopter and then lifted through thickening fog down the valley to the town of Field. There was no room for error with this parcel courier.

This first-hand exposure to a field site has helped me to appreciate the courage and dedication of ROM experts. Fieldwork tests one's skills like nothing else. Des's ability to organize, motivate, and keep his team focused is the reason they are able to complete each field season with ample new evidence of the first animals on earth. The ROM is known around the world for this standard of professionalism, and it was quite something to witness it in operation.



Lindsay Sharp (left) with his wife, Robyn, Shauna McInnis of Parks Canada, and Des Collins at the Burgess Shale quarry.

the world. Normally fossils do not survive the formation of mountains, but in this case a submarine cliff of limestone protected a large pocket of spec-

THE ROM

PATRON

The Honourable Hilary M. Weston
Lieutenant Governor of Ontario

BOARD OF TRUSTEES

Stephens B. Lowden, *Chair*
Harriet E. Walker, *Vice-Chair*
Michael A. Levine, *Vice-Chair*

Wendy M. Cecil-Cockwell,
J. Robert S. Prichard, Lindsay Sharp,
Josephine M. Breyfogle,
Donald R. Brown, Robert D. Brown,
Ann Cameron, Brenda McCutcheon,
Alan C. Middleton, E. M. (Yeti) Agnew,
Bronwyn Krog, Jean M. Read,
Robert T. E. Gillespie, Andrea M.
Bronfman, John F. Prato,
Belinda Stronach, Joey Tanenbaum,
Richard S. Wernham

Andrea Schneider, *Secretary*

SENIOR STAFF

Lindsay Sharp, M.A., D. Phil. (Oxon.)
President and Chief Executive Officer
Margaret L. Beckel
Chief Operating Officer
Michael Shoreman
Senior Vice-President, Business and Capital Development
Robert Barnett
Vice-President, Cultural Innovations
Jan Howlett
Executive Director, Visitor Experience
Anthony M. Hushion
Vice-President, Exhibits, Project Management, and New Media Resources
Joel Peters
Executive Director, Marketing and Commercial Development
Hans-Dieter Sues, Ph.D. (Harv.)
Vice-President, Collections and Research
Barbara Wade
Vice-President, Administration
David Palmer
President and Executive Director, ROM Foundation

DISCOVER THE WORLD OF THE ROM THROUGH THE PAGES OF

ROTUNDA

THE MAGAZINE OF THE ROYAL ONTARIO MUSEUM

Rotunda takes you to
the cutting edge of research
and behind-the-scenes
with the curators of
the Royal Ontario Museum.



**EXPLORE
LIFE ON
EARTH**



**VISIT THE
PEOPLES OF
CANADA**



**IMMERSE
YOURSELF IN
CULTURE,
ART AND
DESIGN**



**SEARCH THE
EARTH &
COSMOS**

**Three, full colour, issues per year will
take you around the world and into the collections
of the Royal Ontario Museum**

To subscribe, please write to:

Rotunda Subscriptions, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6,
or call us at (416) 586-5581 or fax us at (416) 586-5887

Be sure to provide your mailing address,

and let us know whether to send

one year of Rotunda (just \$11.97 plus GST) or two (only \$19.97 plus GST).

SUBSCRIBE NOW AND SAVE ON THE NEWSSTAND PRICE



Dr. Hugh Wylie

*Department of Near Eastern
and Asian Civilizations*

SHORTLY BEFORE THE OPENING of the Gallery of Korean Art, for which he was co-curator, Dr. Wylie ("The Essential Korea") died suddenly. The gallery and his published works will be a lasting credit to his dedication to the ROM and to the promotion of understanding the arts of East Asia in the West. He was a respected scholar, able to interpret complex information and present it in ways both entertaining and easily understood. His untimely death is a loss felt by the academic community and the ROM.



Dr. Hans-Dieter Sues

Vice-president, Collections and Research

DR. SUES ("Hunting for Dinosaurs in Tamerlane's Backyard") has conducted palaeontological fieldwork in many regions of the world and is particularly interested in the evolutionary history of dinosaurs and their relatives.



Wonyoung Koh

*Department of Near Eastern
and Asian Civilizations*

MR. KOH ("The Essential Korea") is a guest curator for Korean Art. He served as co-curator of the Gallery of Korean Art and co-author of the book *Korea: A Timeless Beauty*.



K. Corey Keeble

Department of Western Art and Culture

MR. KEEBLE ("Sculpture and the Virgin"), curator of decorative arts at the ROM, is a recognized authority on the history of Renaissance and Baroque bronze sculpture and European arms and armour. He is a popular speaker on a wide variety of subjects, including Medieval sculpture, stained glass, and ships.



Dr. Janice Hughes

*Centre for Biodiversity
and Conservation Biology*

DR. HUGHES ("The Enigmatic Hoatzin"), a ROM research associate, studies the systematics, behaviour, functional morphology, and biogeography of cuckoos and related birds. She recently impressed members of the American Ornithologists' Union with her hoatzin classification.

**GENERAL INFORMATION
ROYAL ONTARIO MUSEUM**

The public is invited to join the Royal Ontario Museum and to share in its activities. Members automatically receive *Rotunda*. For further information write Membership Services, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6, or telephone (416) 586-5700.

The Main Building,
100 Queen's Park:
(416) 586-5549
Sigmund Samuel Canadiana
Building, 14 Queen's Park
Crescent West: (416) 586-5524

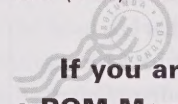
READER SERVICE

QUESTIONS

ABOUT YOUR
ROTUNDA
SUBSCRIPTION?

Call or write

Rotunda Subscriptions
Royal Ontario Museum,
100 Queen's Park,
Toronto, Ontario M5S 2C6
phone: (416) 586-5581
fax: (416) 586-5887



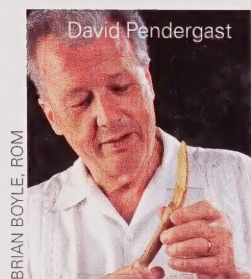
**If you are
a ROM Member,
please contact**

Membership Services,
Royal Ontario Museum,
100 Queen's Park,
Toronto, Ontario M5S 2C6
(416) 586-5700.

*We are here to answer
your questions.*

EXPLORA

EARTH AND COSMOS | LIFE ON EARTH | CULTURE



Vomit Spatulas

An unusual Taino gift

NOT EVERYONE fancies inducing the expulsion of the stomach contents by sticking a spatula down one's throat, but for the Taino, a pre-Columbian people of Cuba and other islands of the Caribbean, vomit spatulas were an important and oft-used part of life. The reason? Ritual purification. Vomit spatulas of bone and shell occur with some frequency in Taino archaeological sites, and wooden ones have been recovered at Los Buchillones, Cuba, where a ROM-led Canadian-Cuban excavation is in progress.

Due to my lifelong Maya research, I realized that among the Maya objects from the ROM's excavations at Altun Ha, Belize, in the 1960s is a Taino vomit spatula made of manatee rib. The artifact is the first irrefutable proof of contact between the Maya and the Taino.

David Pendergast



Coins of the Kushan Kings

A little-known Asian dynasty revealed

TWENTY COINS in the ROM's collections were minted by kings of a little-known ancient Central Asian dynasty called the Kushan. In the 1st to 4th centuries AD, this empire extended across a vast stretch of Central Asia, controlling most of the Silk Road centres in areas known today as Uzbekistan, Afghanistan, Pakistan, Kashmir, and northern India. Kushan kings produced a complex coinage in copper and gold denominations that was rivalled in ancient times only by that of the Romans.

For generations historians knew little about a "vast and mysterious coinage" dating to the early Kushan period. No royal name ap-

peared on the coins, only the epithet "Soter Megas," or Great Saviour. The unnamed ruler is now known to be Vima Takto, whose identity eluded scholars until 1996 when the translation of a rock inscription found in Afghanistan was published, naming the first four Kushan kings.

During his reign (c. AD 80–100), Vima Takto expanded his empire from Bactria and Gandhara deep into India. The coin inset above represents one of the most common of Kushan coins, featuring a diademed and radiate bust similar to those depicted on Bactrian Greek currency.

A gold stater (above), issued by a later king, Vasudeva, is in near-mint condi-

tion and reveals superb craftsmanship. It portrays the king making an offering at a small fire altar, reflecting an image found on earlier Kushan coins.

An intriguing but unknown crest-like design clearly visible on both coins, though it varies somewhat from king to king, has served as a key identifying element in Kushan numismatics.

After the empire's collapse, Kushan cities and monuments were buried in the dust of Sasanians, Guptas, Huns, and Mughuls, leaving the coins as the most significant remnants of this lost civilization and the single most important source of information about the ancient Kushan kings.

David Jongeward



BRIAN BOYLE ROM

The Splendid Thorny Oyster

Beauty in the deep

YOU'RE NOT LIKELY to see it on the half-shell in a restaurant or oyster bar, but the fetching Atlantic thorny oyster (*Spondylus americanus*) is one of the most favoured of molluscs among collectors, who prize the varied and spectacular colours and the fragile spines of its shell. This misnamed warm-water "oyster," also known as the American chrysanthemum shell, is actually more closely related to the scallops. Found in offshore waters from North Carolina to Brazil at depths of 10 to 50 metres, the thorny oyster is heavily overgrown with sponges and algae in its natural state. The specimens pictured above, from the Gulf of Mexico off Florida, are part of a major shell collection recently

acquired by the Museum.

A huge variety of sea shells—the protective exoskeleton "homes" of molluscs—have been admired as objects of beauty since antiquity. Some 60,000 species are recognized worldwide living in fresh waters, on land, and in the sea. Molluscs have been employed by human cultures around the globe as a food source and as currencies of exchange, tools, decorations, symbols of status, and collectors' items. Even royal purple, the celebrated regal dye of the ancient Mediterranean world, was extracted from molluscs. Today, this group, which includes oysters, clams, scallops, mussels, and squids, is of major economic importance as a fisheries resource.

Dale Calder



BRIAN BOYLE ROM

Under the Unguent Cone

A figment of ancient Egyptian imagery?

VIRTUALLY ALL of the objects depicted in ancient Egyptian paintings are also represented in archaeological collections. All, that is, but one curious item known as the unguent cone. This mysterious image first appears in tomb paintings early in the 18th Dynasty (1500 BC), most often in a banquet context, as a cone of perfumed unguent sitting on the head. How it was fixed to the hair, wig, or, in some instances, the bald head is not apparent. Some Egyptologists have suggested that the balm slowly melted during a party, leaking from the cone to cover the hair and upper clothing in a sweet, sticky mass. This seems highly unlikely in view of the great interest Egyptians took in personal body care and adornment.

A recent study suggests that the cone might simply have been a symbolic, graphic expression of the invisible state of being perfumed. Ancient Egyptians closely connected perfumed unguent with seduction and sexual activity, which in turn was linked to ideas of rebirth in the afterlife. The unguent cone would have been a suitable symbol of such renewal. But it remains possible that these cones did exist as items of adornment that have yet to be discovered.

Roberta Shaw



AUTHENTIC HOME INSURANCE

Every home is unique. At Chubb, we understand that. We make sure that your home's authenticity is maintained, even when things must be replaced. For more information about the protection you and your home need, call your local insurance broker or contact Chubb Insurance Company of Canada at (800) 268-4120.

CHUBB INSURANCE COMPANY OF CANADA
www.chubbinsurance.com

**INSURE
YOUR
WORLD
WITH**





THE CASTING OF CANNONS

Scroll paintings document a decisive moment in Japanese history



The casting of cannons depicted in this set of beautiful scroll paintings marks the beginning of Japan's militarization in the late 19th century

more than 16 metres (52½ feet) in length, totalling a prodigious length of 50.5 metres (165½ feet). Each step of the cannon-manufacturing process is rendered in great detail: the making

A SET OF THREE exceptional Japanese scroll paintings, recently acquired for the ROM's East Asian collection, is a great work of art and at the same time a historical document of the highest importance. In 26 scenes, augmented by explanatory text, the scrolls depict the manufacture of 25 European-style cannons in Edo (present-day Tokyo), Japan, in the year 1851.

Painted by Yamazaki Tomoo (1798–1861) in ink and watercolour on paper, the three scrolls were acquired in May 1998 thanks to gener-

KLAAS RUITENBEEK

ous support from the Louise Hawley Stone Charitable Trust. Each measures 34 cm (13¼ inches) in height and

of the moulds, the casting (see above), the finishing of the cannons, the casting of the cannon balls, the testing of the cannons by firing a test shot into a trench, and finally, the hauling of the brightly polished cannons to a shed where they are carefully inspected.

The artist had an eye for human interest: he painted the workers wolfing down their meals in the canteen, their contorted facial expressions as they haul the heavy cannons, and the

The Restaurants of the ROM



Druxy's Famous Deli serves delicious soups, healthy salads and hearty made-to-order sandwiches.

The informal deli atmosphere, individualized meal preparation and 300 seat capacity make Druxy's a great spot for a quick snack, leisurely lunch or coffee break. Druxy's is located on the Museum's first floor, just inside the front entrance and next to the ROM Gift Shops.

Druxy's also offers special menus for schools and adult groups and catering for casual events.

For more information
call the OFFICE OF SPECIAL EVENTS
AND GROUP SERVICES at the ROM.

Tel: (416) 586-5572

Fax: (416) 586-5792

Web: www.rom.on.ca

amazement of passersby (a monk, a pedlar, a fashionable lady, and fighting children) at these strange objects being carried on carts through the street. Even tattoos seen on some of the workers are intricately rendered.

In July 1853, American naval officer Commodore Matthew Calbraith Perry (1794–1858) arrived in Edo with his "Black Ships," ending more than two centuries of isolationism, during which Japan maintained diplomatic and trading contacts with only the Dutch and the Chinese. The scenes depicted in Yamazaki's painting thus took place just prior to Japan's opening to the outside world; an introductory essay on the first scroll (rendered in beautiful calligraphy by Akagari Sadaaki and dated the 12th month of the year 1853) was written shortly afterwards.

Some three years earlier, cannons had first been installed along the coast of Japan to ward off foreign ships. Japanese leaders were aware of the tensions between Britain and China that had led to the first of the Opium Wars (1839–1843). After 1853—and even more aggressively after the Meiji Reforms of 1868—the nation dedicated itself to the development of a modern military system. This resulted in Japan's victory over Russia in 1905, the first time an Asian nation had defeated a Western power. This in turn led to Japan's accelerated militarization in the 20th century and eventually to the disastrous showdown at the end of World War II. The three scroll paintings, created in 1851–1853, document in a wonderful work of art the very beginning of this chain of events.

On a more technical note, it is fascinating to see in the paintings how the Japanese combined their own traditional crafts and techniques with an imported technology to cast the heavy, 2.4-metre- (8-foot-) long breech-loaders. But the images also give rise to several questions. Although the cannons have threaded breeches, the paintings show the piece of ordnance being loaded from the muzzle before the test shot is fired. The removable

threaded breech seems to be an indigenous Japanese invention, as in the West all cannons were muzzle-loaders until the appearance of the Armstrong Gun in 1855, which had a threaded breech of different construction. The cannoneer in the painting apparently continued to rely on the older method of loading the gun, which dates from the 16th century when the Portuguese first introduced European-style muzzle-loaders to Japan. The shape of the cannons with their bulbed barrels and trunnions, both near the muzzle and breech, also resemble the Dragón, or Cannon-Drake, which was popular in Portugal in the 16th century.

Cannons of the more usual European type, muzzle-loaders with a barrel that tapers evenly from the base of the breech to the muzzle, have been documented in photographs made in 1864 near Shimonoseki. Some of these cannons are known to date from 1854, so it is probable that those depicted in the ROM's scrolls were very soon outdated. The first photographs taken in Japan date to 1853, the work of a photographer in Perry's retinue. After 1860, photography became common. In the painting of the scrolls, Yamazaki certainly intended to record with photographic accuracy the process of casting the cannons, most likely for the authorities who had commissioned them. But later cannon-casting enterprises in Japan were documented by means of the camera. The ROM's newly acquired paintings thus have an additional symbolic significance: they record the beginning of the modern era in Japan but for the last time expressed by the ancient means of the painter's brush.

Klaas Ruitenbeek holds the Louise Hawley Stone Chair of Far Eastern Art at the Royal Ontario Museum.

Sections of this intricate work will be on view in the newly opened Herman Herzog Levy Gallery of Art until April 2000.



DARK NIGHTS AND BRIGHT STARS

Orion the Hunter stalks the winter skies



IAN MCGREGOR, ROM

LATE AUTUMN and winter skies are dominated by the most impressive star picture visible in the night skies—Orion the Hunter. The figure of a giant human is well defined by seven bright stars, two marking the shoulders, three equally spaced stars in a line forming a distinctive belt, and two representing the legs. Many

cultures around the world have recognized a human figure among these stars. In China, for example, the im-

IAN MCGREGOR

age was linked to the military commander Tsan; in ancient Egypt, it was connected to Osiris, god of life and

The figure of a giant human among the stars in the winter sky, recognized by many cultures around the world, is best known today as the Greco-Roman figure Orion the Hunter.

death. For other cultures, such as the Maya of Mesoamerica, the prominent belt stars define the image of a turtle

The Restaurants of the ROM

ETRUSCO at the ROM



Renowned Toronto restaurateurs *Roberto and Lucia Martella* (of *Grano Restaurant*) bring bistro-style atmosphere and outstanding Mediterranean fare to the ROM's **Etrusco Café**.

Located on the first floor, near the main entrance, Etrusco Café is open daily during Museum hours for à la carte or snack service and is also available for group bookings and special events.

For more information,
call the OFFICE OF SPECIAL EVENTS
AND GROUP SERVICES at the ROM.

Tel: (416) 586-5572
Fax: (416) 586-5792
Web: www.rom.on.ca

from whose cracked shell is rising First Father, the creator of the stars. But it is the Greco-Roman figure of mighty Orion the Hunter—striding across the southern skies in eternal battle with Taurus the Bull and accompanied by his two hunting dogs—that is best known today.

SKY HIGHLIGHTS

The Sun

FOR EARLY PEOPLES of the northern hemisphere, the lengthening hours of darkness as the fall season progressed brought fear that the sun might not rise again. On the day of the December solstice, the sun would rise in the southeast, cross the southern sky for a few hours, and then set in the southwest. This year, northern hemisphere winter officially begins at 2:44 a.m. EST on December 22. From that point in time, the number of hours of daylight gradually increases until the arrival of the summer solstice approximately six months later.

Earth

AT 1 A.M., ON JANUARY 3, 2000, our planet will reach its minimum distance from the sun for the year at 147,000,000 kilometres (91,140,000 miles).

Eclipses

ALL OF THE WESTERN HEMISPHERE will experience a spectacular total eclipse of the moon on the evening of January 20/21. At moonrise, the brilliant white full moon will appear along the eastern horizon. But as the evening passes, a wave of darkness will slowly

creep across the moon's face until it becomes a dim orange-red. As the darkness then retreats the moon will return to its former brilliance. The moon will visibly enter the Earth's shadow at 10:01 p.m. EST, enter mid-eclipse at 11:44 p.m. EST, and visibly leave the Earth's shadow at 1:26 a.m. EST. There will not be another lunar eclipse as visible to Canadian observers until May 2003.

Prominent Planets

EVENING SKIES ARE DOMINATED by the two bright planets Jupiter and Saturn, located in the southern sky to the west of Orion and relatively close together. Jupiter is the brightest star-like object in the night sky. In the early winter, fast-moving Mars joins the two brighter planets to form an attractive grouping. Early morning risers should look for brilliant Venus in the eastern sky before sunrise.

Meteor Showers

ON ANY GIVEN NIGHT an observer with good sky conditions can see about five meteors crossing the night sky per hour. On about 12 nights each year this number may increase dramatically when the Earth passes through the rocky debris of an old comet, and an observer with dark skies and no moonlight interference will enjoy a celestial fireworks display. The best observing time is after midnight. The chart below shows the autumn and early winter meteor-shower activity.

Ian McGregor is an astronomer in the ROM's Education Department.

METEOR SHOWERS

Name	Peak Night	Moon Phase	Predictions
Orionids	October 22/23	Full Moon	Poor
Leonids	November 17/18	Gibbous Moon	Good to excellent
Geminids	December 14/15	Waxing Crescent	Good
Quadrantids	January 3/4	Waning Crescent	Good



COLD COMFORT

How togetherness helps garter snakes weather northern winters

AS THE DAYS grow shorter and the nights nippier, Canadians are already preparing for winter. While people nudge up the thermostats in their homes, Canadian wildlife must find their own means of coping with northern winter in the out-of-doors.

Their strategies are various. Mammals and birds are endothermic—they are able to produce their own metabolic body heat. With the help of a heavier coat and a little extra body fat, these species can remain active all winter, although most birds migrate to more southerly climes. But most wildlife, in fact all other animals, are ectothermic—they cannot create their own body heat through metabolic processes.

In summer, northern ectotherms absorb the heat they need from a warm substrate (usually soil or rock) or directly from the sun. But in winter, there is little available warmth, and dropping temperatures slow ectothermic metabolisms, rendering these species inactive in the cold. So what is an ectotherm to do? There are two big challenges: how to survive the long, cold winter and how to make the most of the short summer. The first is straightforward; ectotherms overwinter in locations in which they can avoid freezing and where their reduced mobility will not leave them vulnerable to predation. But the second is more complex. Canadian fauna have only a few months of benign summer weath-

er in which to reproduce, grow, find a place to spend the next winter, and store enough energy reserves to last

ROSS MACCULLOCH

until the following spring.

Fortunately, species that live at northern latitudes have developed a

number of adaptations that allow them to accomplish all of this in the limited time available. Using an example from my specialty, herpetology, let's look at the garter snake (*Thamnophis sirtalis*). It is the most widespread Canadian reptile, occurring in every province and territory except Newfoundland and Nunavut. A glance at any field guide shows that garter snakes occur much farther



KEITH RONEY

The Restaurants of the ROM



J a m i e
K E N N E D Y
at the
M u s e u m



Discover why food critics rave about chef *Jamie Kennedy's* elegant fine dining restaurant at the ROM. Experience the cuisine of one of Canada's most celebrated chefs in an atmosphere of comfortable sophistication.

Located on the fourth floor of the Museum, **JK ROM** is open daily for à la carte lunch and is available for group bookings and special events.

For more information
call the OFFICE OF SPECIAL EVENTS
AND GROUP SERVICES at the ROM.

Tel: (416) 586-5572
Fax: (416) 586-5792
Web: www.rom.on.ca

north than any other snake species. In many parts of its range, these snakes are numerous. From a biological viewpoint, abundance plus a wide distribution spells success.

What allows the garter snake to flourish at such high latitudes? The answer involves reproduction. For a species to maintain itself in a given location, it must have the ability to successfully reproduce, generation after generation. Garter snakes have an edge over other serpents in that they do not lay eggs; instead, the female carries the growing embryos until they are fully developed. During the day, gravid females move from place to place, choosing warm basking locations and maintaining their body temperature at the optimum for incubation. In this way, embryonic development is accelerated. The young snakes are born in the shortest possible time, often as early as two months after mating.

This phenomenon is found worldwide: reptiles inhabiting areas with short growing seasons, either at high altitude or high latitude, are viviparous (live-bearing). By contrast, most other reptiles, snakes included, are egg-layers. For these species, the speed of embryonic development within the eggs depends on the nest temperature, which can vary greatly during the day. Embryos of the egg-laying fauna also take longer to develop than do those of live-bearing species.

Another reproductive advantage of garter snakes is their habit of spending the winter in a hibernaculum, or den, where they congregate in large numbers. Like many Canadian reptiles, garter snakes move underground to avoid extreme winter temperatures. They usually choose rock formations with cracks or fissures, which allow them to descend below the frost line where they can avoid both the cold and their predators. Many other snake species spend the winter in communal hibernacula, but none in the great numbers found in garter-snake dens, particularly those in the western provinces. On the first

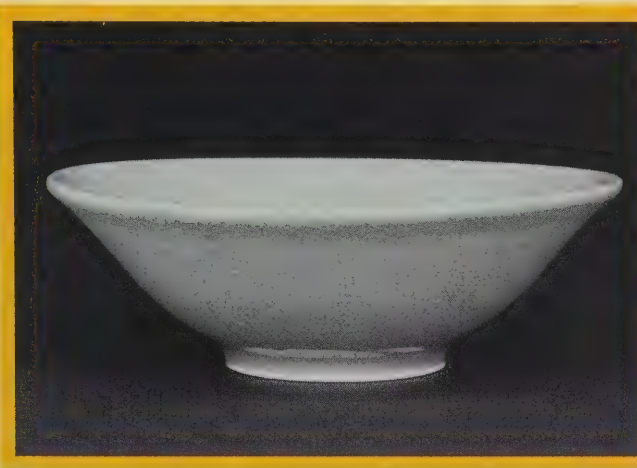
warm days of spring, the garter snakes emerge together and their large numbers allow mating to take place immediately. Rather than spending all-too-scarce summer days searching for a mate, a female garter snake can begin incubating her brood right away.

During the summer months snakes disperse in search of food. Towards autumn they habitually return to the same den year after year. As human numbers increase, we continually reduce the availability of wildlife habitat. Sometimes a snake hibernaculum is lost, and when the returning snakes cannot find their traditional den, they search for new places to overwinter. They explore buildings, excavations, and other human constructs in the search for a new home. To a snake, a cracked foundation or a broken basement window offers a refuge from the coming cold. Homeowners are often understandably alarmed by the arrival of a large number of snakes in their house. There is no chemical repellent that is effective against them; snakes must be physically prevented from entering where they are not wanted.

For homes in rural areas or near known hibernacula, an annual inspection of the foundation is prudent. Sometimes snakes enter a basement and pass the winter there unnoticed until they emerge in the spring. At this time, their place of exit can be pinpointed and the entrance closed to prevent their return. Abandoned buildings or unused basements can become established hibernacula. Purchasers of older buildings may be surprised to find that they are sharing their new property with a den of snakes.

We must remember that we share our yards, and our world, with a large number of other species. Some conflict may be inevitable, but it can be minimized by trying to understand the needs of our neighbours.

Ross MacCulloch is assistant curator of herpetology in the ROM's Centre for Biodiversity and Conservation Biology.



Korean Porcelain Tea Bowl
inspired by celadon-glazed stoneware bowl
Koryo Dynasty, 11th Century a.d.



Royal Ontario Museum
416-586-5896
www.rom.on.ca/shops/repro

ROM Reproductions Shop

**Authentic
Reproductions
from the ROM's own
Collections**

**Unique Wedding Presents
and Holiday Gifts**

Experience our World



- ☙ Belize: Maya Mysteries Amid Forested Splendor
- ☙ Italy: Treasures of Umbria and Tuscany
- ☙ Namibia and The Cape: A Flying Safari
- ☙ New York State: Grandeur and Charm Along the Hudson River
- ☙ Georgian Ireland: Homes and Gardens
- ☙ Turkey: Crossroads of Civilization
- ☙ Loyalists's Trail: Prince Edward County, St Lawrence River
- ☙ Ancient Egypt: Heir to a Fabulous Past
- ☙ Los Angeles: The Getty and More

As advertised in ROM Members News.

For further information or a
brochure call **ROM Travel**
(416) 586-8034

Organized by
The Department of Museum Volunteers
Royal Ontario Museum

**ROM
TRAVEL**



Dr. Janice Hughes with hoatzin, the bird that had previously defied classification.

The

Classifying One of the World's Oddest Birds

Enigmatic

BY JANICE M. HUGHES

Hoatzin

I

N THE LOWLAND FORESTS of northern South America, a bizarre and ungainly bird called the hoatzin (pronounced watson) stumbles through the foliage. Often seen lined up along branches like stooped men waiting for a bus, the members of this blue-faced, scraggly-crested species are aptly described by their scientific name *Opisthocomus hoazin*—a derivation of Greek and indigenous South American languages meaning “big chicken wearing its long hair behind.” The only problem is that the “chicken” reference is outdated. No longer considered a relative of fowl, the hoatzin’s correct taxonomic position has been one of the most vexing problems in avian classification. Millions of years of independent evolution has resulted in a species so anatomically and behaviourally divergent that it is difficult to ally it with other living birds.

In 1776, the hoatzin was first described as *Phasianus hoazin* owing to its apparent physical similarity to pheasants, fowl-like birds classified in the avian order Galliformes. Despite much evidence to the contrary, this first taxonomic position influenced the way that systematists subsequently viewed the bird, although there has certainly been no consensus among ornithologists. In the 200 years since the

hoatzin’s discovery, it has been classified with cuckoos (Cuculiformes), turacos (Musophagiformes), mousebirds (Coliiformes), rails (Gruiformes), and pigeons (Columbiformes). Some taxonomists preferred to position the species in its own order (Opisthocomiformes), but no agreement on the placement of this order among the others has been reached.

Difficulties have persisted because the hoatzin’s odd appearance is not its only peculiar attribute. These birds occupy riparian vegetation in lowland habitats of the Amazon and Orinoco river drainage basins. They live entirely in trees and bushes, such as giant arums and coastal mangroves, which provide nesting and roosting sites, protection from predators, and food. Although the consumption of foliage, known as folivory, is not uncommon among tropical birds, the hoatzin has evolved a unique means of processing vegetation. It is the only bird that uses active foregut fermentation like that of cows and sheep to digest plant cellulose.

In an enlarged and thick-walled muscular crop and lower esophagus, a host of resident bacteria efficiently extract nutrients from the hoatzin’s nutrient-poor diet and assist in breaking down toxins in the leaves of its favoured tropical legume trees. Some authors have reported that the birds smell like fresh cow manure from some distance; in Guyana they are known as “stinking pheasants.”

These inactive birds generally limit their movements to creeping clumsily through vegetation. Their awkwardness is particularly evident after feeding. A full foregut may comprise 25 per cent of the bird’s total body weight, raising its centre of gravity and contributing unfavourably to an already graceless means of locomotion. Consequently, hoatzins spend up to 75 per cent of their day roosting or sternal perching, a peculiar

behaviour wherein the bird props its bulging chest on a branch during digestion. A tough, elliptical callosity covers the lower tip of the sternum, or breastbone, to protect the delicate skin from abrasion.

Because the sternum—the skeletal element to which major flight muscles are attached—is greatly reduced to accommodate the oversized foregut, the bird's flying ability is also compromised. Weak and laboured, hoatzin flight is usually limited to short, rapid bursts and gliding. Its poor capacity for movement has rendered the hoatzin one of the most spatially restricted of all birds, which has had important implications in its social structure and breeding system.

Highly gregarious throughout the year, hoatzins are usually observed in groups of 40 or more grunting and croaking individuals, often perched

nestling growth. The long period of vulnerability, coupled with odoriferous nest environs, places young birds at great risk from predation by monkeys, other mammals, and raptors.

Fortunately, nestlings have evolved a singular predator-avoidance strategy facilitated by two functional claws on the wrist joint of each wing. These structures so resemble the wing claws of the 150-million-year-old reptilian bird *Archaeopteryx lithographica* that ornithologists once speculated that the two

Top: A hoatzin creeps clumsily through the vegetation.

Bottom: Two hoatzins guard their nest of two to four white-and-lavender-spotted eggs.



leaning against one another. The birds breed within densely packed territories in family units of two to eight members, comprising parents, and subadult or adult male helpers, usually offspring from previous broods. Helpers participate in all breeding activities except mating and egg laying. They are particularly effective in defending the nest from predators, which substantially improves the group's reproductive success. Helpers stay with their parents for one or two breeding seasons, then disperse to establish their own breeding territory at about three years of age.

Nests are flat, unlined platforms 30 to 45 cm (11¾ to 17½ inches) wide, made of loosely placed dry twigs. They are of such flimsy construction that the two to four white-and-lavender-spotted eggs can be seen through the twigs from below. Weighing about 20 grams at hatching, nestlings are fed half-digested leaves regurgitated from their parents' crops, a sticky mash rich in foregut bacteria that inoculates them with the microbial complement required for digestion. The nutrient-poor vegetation on which they feed results in slow

species were somehow related. Today we know that hoatzin claws evolved independently as an adaptation to early fledging, although both functional anatomists and palaeontologists have found the study of hoatzin nestlings useful in their reconstructions of the locomotory habits of *Archaeopteryx*. Most hoatzins lose their wing claws at 70 to 100 days of age, although some adults will retain them and others have been known to regrow them after they have been shed.

Strategic nesting over watercourses offers the hatchlings a degree of protection. Unlike adults, the young birds swim well. If threatened, nestlings as young as three days of age

will jump out of the nest and splash into the water below. They propel themselves by paddling with their feet, and can also dive and swim by using their stubby wings to fly under water. Once the threat has passed, nestlings swim to the base of the natal tree and climb back into the vegetation using the claws of both wings and feet. They are frequently encouraged from above by the vocalizations of their parents. Other family members may move to lower parts of the tree and spread

contradict the traditional taxonomy, most formal classifications strictly adhered to an alliance with Galliformes.

A much less popular hypothesis, first proposed in the mid-19th century, suggests that the hoatzin is most closely related to turacos, a poorly known 20-species family (Musophagidae) of arboreal African birds. Turacos have long been considered the sister group to cuckoos (Cuculidae), and are frequently classified among the Cuculiformes. Tura-

cos inhabit deep forests and are adept at moving quickly through dense vegetation in search of fruit. They, too, fly poorly, spending little time in the air or on the ground. Only a few taxonomists, relying predominantly on external morphology and osteology, linked the hoatzin with this enigmatic group. Avian anatomist Boris Stegmann noted that young turacos, like hoatzin nestlings, have tiny wing



Top: Hoatzin nestlings have two claws on the wrist joint of each wing, allowing them to climb up trees.

Bottom: Unlike adult hoatzins the young birds swim well. If threatened, birds as young as three days old will jump out of the nest and splash into the water below.



their wings to shield the climbing chick from the watchful eyes of predators.

During the past two centuries, these unique anatomical and behavioural adaptations have attracted the attention of many systematists determined to author the definitive statement on hoatzin classification. Throughout the 19th century, most ornithologists favoured placing the species with gallinaceous birds, such as guans, pheasants, and grouse. Anatomists cited similarities in the vertebral column, palate, vocal apparatus, and microscopic feather structure to support their conclusions. Although others presented compelling evidence to

claws for climbing among branches of the nesting tree before their flight feathers have fully developed. Both species exhibit a characteristic retardation in wing-feather growth that facilitates this form of locomotion.

The taxonomic importance of these characteristics nonetheless failed to convince most avian systematists, and the proposed affiliation

between turacos and the hoatzin was all but forgotten. By the 1960s, some taxonomists began to question the steadfast placement of the hoatzin among Galliformes. Following a detailed examination of hoatzin feathers, molting patterns, and general anatomy, notable ornithologist Erwin Stresemann concluded (translated from German): "If *Opisthocomus* is related to gallinaceous birds, it is only by way of Adam and Eve." Tradition was giving way to reason, and this time the candidacy for hoatzin sister taxa fell to the cuckoos.

An ancient and diverse family comprising 140 species of near-global distribution, cuckoos are best known for the 51

species of brood parasites that lay their eggs in other birds' nests, leaving the responsibilities of child-rearing to foster parents. However, cuckoos are highly heterogeneous in their habits. Among the group are four cooperatively breeding species. Similarities between them, particularly the guira cuckoo (*Guira guira*), and the hoatzin—in both breeding habits and external appearance—did not go unnoticed. In 1973, Yale University researchers Charles Sibley and Jon Ahlquist addressed the relationship between these two taxa through electrophoretic comparisons of their egg-white proteins. They concluded that the hoatzin was indeed a cuckoo, most closely related to the cooperative breeders.

They revisited this verdict in 1990 in their landmark phylogenetic analysis of Class Aves (all birds) using DNA-DNA hybridization (*The Phylogeny and Classification of Birds*). In this molecular technique, double-stranded DNA from two different species is combined, split into single strands, and then allowed to reassociate randomly. The degree of sequence similarity between the two DNAs can be determined by measuring the temperature at which the hybrid molecules melt. This study reconfirmed their opinion that the hoatzin was a cuckoo. Subsequent classifications based on Sibley and Ahlquist's results placed the hoatzin between the guira cuckoo and the familiar greater roadrunner (*Geococcyx californianus*) of the American southwest.

This association was questioned by renowned avian anatomist Walter Bock, who suggested that the hoatzin's anisodactyl foot structure (three toes forward, and one toe back) was sufficient to exclude it from the zygodactylous (two toes forward, two toes back) cuckoos. In addition, Sibley and Ahlquist's methodology has been highly criticized, and some authors have advised against using their results for comparative study.

Nevertheless, most ornithologists continued to support a relationship between the hoatzin and the cuckoo family. Since Sibley and Ahlquist, three molecular analyses have attempted to confirm the taxonomic affiliation using DNA sequencing. This method improves on DNA-DNA hybridization because it accurately maps the arrangement of nucleotides, the basic units of information encoding all living things, along a strand of DNA. The sequences of one species can be directly compared to those of another to determine their degree of relationship.

Between 1994 and 1997 these studies concluded, with varying degrees of confidence, that the hoatzin is not a cuckoo itself, but is the closest living relative of the cuckoo family. The reputation of these systematists was sufficient to convince most ornithologists. The case of the phylogenetic rela-

tionships of the enigmatic hoatzin was considered closed.

My interest in hoatzin systematics began three years ago when my phylogenetic reconstruction of cuckoos using osteological characters prompted a detailed examination of more than 400 bird skeletons from all avian groups to which they could be related. These included turacos and the hoatzin. Cladistic methodology requires the use of an outgroup, a taxon deemed to be the closest relative of the study group, to de-

Glossary of Scientific Terms

Systematics: the classification of living organisms into hierarchical groups reflecting their phylogenetic relationships.

Phylogeny: the evolutionary history of a group or lineage.

Taxon (plural: taxa): any group(s) of organisms at any level of classification sufficiently distinct from other groups to be treated as a separate unit.

Sister taxa: taxa with a common ancestor that is not shared with any other taxon.

Cladistics: a method of classification that uses recency of common ancestry as the criterion for grouping taxa.

Mitochondrion: an organelle found in all cells of some organisms that is responsible for the production of cellular energy. It possesses a circular chromosome distinct from those found in the cell nucleus.

Electrophoresis: The separation of molecules in an electric field based upon differences in electrical charge, size, or shape.

Osteology: the study of bones.

termine which of different states observed for specific characters are primitive (plesiomorphic) or advanced (derived). Each character state for each taxon is then given a numbered code to reflect this, and a computer program resolves the relationships between the taxa under investigation.

When my analysis was complete, I was surprised to find the hoatzin associated with turacos, indicating that, at least on the basis of skeletal data, the hoatzin is not a cuckoo at all, but an aberrant form of turaco. I re-examined the methods used in the three earlier molecular analyses of hoatzin phylogenetic relationships and discovered that they all suffered potentially from at least one of three faults: (1) the data sets were too small (859 to 1725 nucleotide base pairs) to resolve the question accurately, (2) the models of molecular evolution were inappropriate, and (3) the wrong outgroups were used—most importantly, the turacos were left out.

I decided to re-assess the hoatzin using very long DNA sequences (5487 nucleotide base pairs) from both mitochondrial and nuclear genomes; a full complement of outgroups, including all taxa to which the hoatzin has been associated historically; and appropriate models of molecular evolution determined empirically using computer software created for this purpose. My results clearly corroborated those derived from my osteological phylogeny: the hoatzin is the sister taxon to turacos, not cuckoos. A variety of statistical and comparative

tests applied to these data did not cause my conclusion to waver.

The sister relationship between the hoatzin and turacos presents some interesting biogeographical considerations, given their respective endemicity in South America and Africa. However, it has been well established that current distribution patterns of many species bear little resemblance to those of the past. Fossils attributable to turacos have been found outside their current sub-Saharan distri-

parted ways because there is another Eocene fossil, *Onychopteryx simpsoni*, which may be more closely associated with the modern hoatzin. Rather, it indicates the existence of a lineage of birds that may have shared an ancestor with the proto-hoatzin-turaco, a species that has since been obscured by a distant point of divergence and subsequent adaptation to highly specialized lifestyles.

With the mystery of hoatzin taxonomy solved, we have



Top: *Foro panarium* from a black and white acrylic painting by John P. O'Neill.



Bottom: Fossil *Foro panarium*, a possible distant relative of both the hoatzin and the turaco.

Care has been taken to trace the ownership of copyright material. The editors welcome any information that will enable them to rectify any incorrect or omitted reference or credit.

bution in France, Germany, and northern Africa. Likewise, hoatzin-like fossils have been unearthed in eastern Colombia and southern Argentina. Furthermore, *Filholornis*, which lived in France about 40 million years ago, shows some affinity with the hoatzin.

Interestingly, elements of both turacos and the hoatzin are combined in the Lower Eocene fossil *Foro panarium* of Green River, Wyoming. This 50-million-year-old, nearly complete fossil skeleton has a skull and mandible very like the hoatzin, but shows some similarities to turacos in postcranial elements. This is not to suggest that *Foro panarium* represents the common ancestor after whom the hoatzin and turaco

only to reclassify it. Based on my conclusions, cuckoos remain in their own order, Cuculiformes, and the hoatzin moves to an order that includes the turacos. Well-established guidelines of taxonomic nomenclature insist that when two taxa are merged, the name first coined that refers to either group has priority over the other, and becomes the new name for the combined taxon. With a stroke of irony, I discovered that the order Opisthocomiformes, dating from 1837, has priority over the order Musophagiformes established in 1933. Hence, the wayward hoatzin, this species with nowhere to call home, will now have companions in an order that was named for it. Elementary, my dear hoatzin.



HENRY JONES

Great blue turaco
(*Corythaeola cristata*)
Turaco family.



ALLEN BROOKS

Groove-billed ani
(*Crotophaga sulcirostris*)
and greater roadrunner
(*Geococcyx californianus*)
Cuckoo family.



Blue-billed curassow
(*Crax alberti*), **Galliform order.**

Below: *Virgin and Child*, N. Italian, c. 1429. Attributed to Pietro Lamberti. Though it dates from the Early Renaissance, the sculpture still shows influences of Late Gothic style in the pose and in the draperies.

SCULPTURE

AND

THE

VIRGIN

IMAGES OF THE VIRGIN MARY cradling the infant Jesus in her arms have played a central role in Christian art for centuries. Evolving from prototypes that existed from as early as the late 2nd to early 3rd century AD, such representations increased dramatically in Western European art during the High and Late Middle Ages (13th–15th century). Devotion to Mary as maiden and mother was an important aspect of humanizing the Medieval world, and the message was spread not only through the influence of the Franciscans and Dominicans but also through the powerful medium of art.

At the height of her popularity in Medieval Europe, Mary—known to the Orthodox Church as the *Theotokos* or Mother of God—embodied a multiple reality: she was mother of Jesus, the figure and type of the Christian Church, and queen of heaven and earth, depicted with royal crown and sceptre. Her many portrayals have changed according to the art and fashion of the day. Medieval paintings and sculptures of the Madonna are not only priceless works of art, but the portals through which we may glimpse the influences of the times and places in which they were made.



THE MANY LOOKS OF THE MADONNA IN MEDIEVAL EUROPE

BY K. COREY KEEBLE

PHOTOGRAPHY BY BRIAN BOYLE

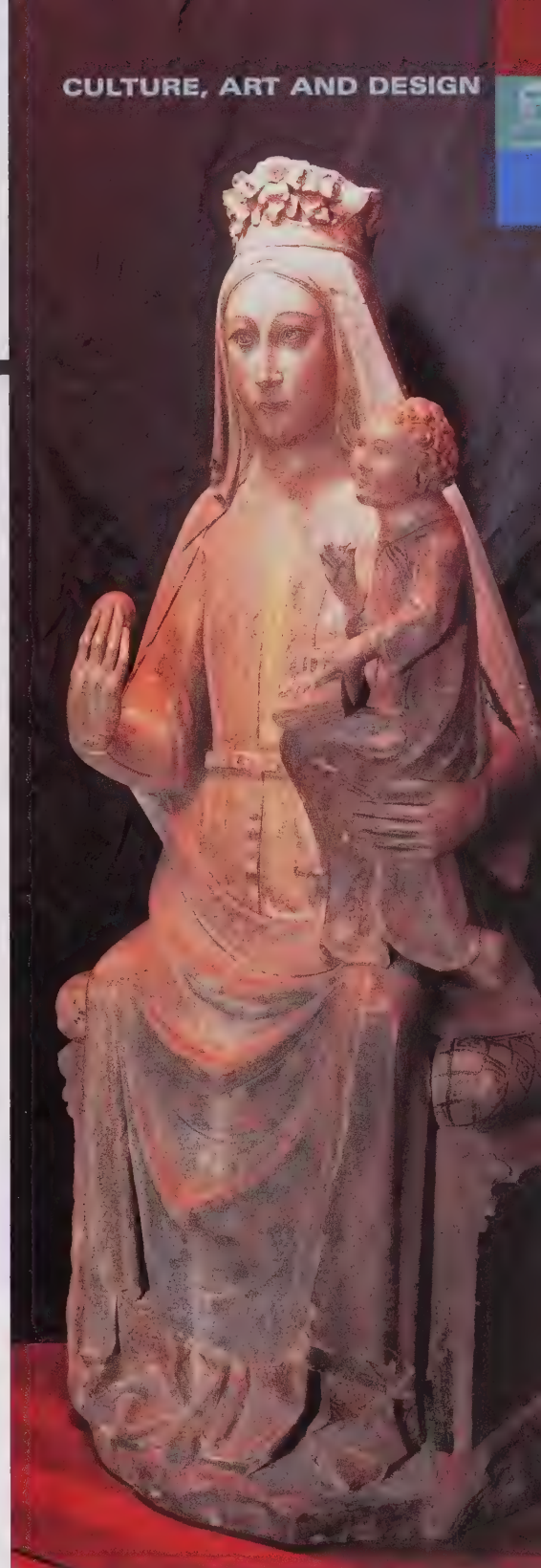


The Royal Ontario Museum is one of the few public institutions in Canada able to offer visitors a view of European sculpture and applied arts of the Middle Ages. The predominant subject matter, not surprisingly, is the Virgin Mary with the Christ child, images that testify to the Christian doctrine of the Incarnation, the belief that God assumed human form in the person of the child Jesus, born of a virgin mother.

The Museum's stone sculptures of the Virgin and child date mainly from the Gothic era (13th to early 16th century) and were dear to the heart of Charles Trick Currelly, the ROM's founding director, who acquired three of them for the Museum between 1936 and 1938. The first (at right), long regarded as Spanish in origin, is interesting for its revelations of fashion. Mary is shown seated and erect, the stiffness of pose suggesting a holdover from the earlier Medieval iconographic type known as *Sedes Sapientiae*, or Throne of Wisdom, in which she is shown seated with the child regally posed on her lap. But along the Virgin's sleeves, the sculptor has carved rows of buttons. Though buttons were known in the 13th century, it was not until the 1300s that their use became widespread, chiefly among the upper classes. In England, monumental brasses of the late 1300s show ladies of rank with rows of buttons extending along their tight sleeves from wrist to elbow and beyond.

Such details indicate the growing practice among artists of depicting the natural, visible world around them. This new interest paralleled the importance given to human reason and the senses in the Scholastic philosophy of St. Thomas Aquinas and his contemporaries. The theologians encouraged an understanding of the natural world as a mirror and image of divine creation. The emerging naturalism of the ROM's 14th-century Spanish Virgin and child is a product of this ethos, which characterized the whole period of Late Gothic art during the 1300s and 1400s, and in some instances lasting to the early 1500s as Gothic art yielded by degrees to the influence of the Renaissance.

Of the two other stone sculpture groups, both acquired in 1938, the earlier one is a French Late Gothic work of the 14th century. Currelly was particularly fond of it, describing it once as the "apple of my eye." The



Left: *Virgin and Child*, French, 14th century. The ROM's founding director C. T. Currelly loved this Late Gothic sculpture, calling it the apple of his eye. Above: *Virgin and Child*, Spanish, 14th century. The sculptor has carved buttons on the inside seams of the Virgin's sleeves from wrist to elbow.



piece belongs to an extensive body of related French devotional sculpture produced for churches and chapels in considerable numbers in the late 1300s and early 1400s. The elegant and subtle "S" curve of the figure of the Virgin, the delicacy of naturalistic detail in the carving of facial features, and the complex decorative linear rhythms of draperies are all tell-tale characteristics of the courtly and aristocratic manifestations of Late Gothic art known as the International Gothic style.

The sculpture dates from the second half of the 14th century and may be compared with numerous surviving 14th-century French examples. It has the same elaborately decorative, textured surface treatment as that of a Virgin and child grouping in the collection of London's Victoria and Albert Museum. Many others of the same virtually standardized and stereotypic form are known in museum collections on both sides of the Atlantic. The

swaying curves of the drapery folds seen in the ROM's group are paralleled in depictions of the draped human figure in other media, including those in the 1373–1381 set of tapestries known as the *Angers Apocalypse*, as well as in illuminated manuscripts, ivory carving, and goldsmiths' work.

The sculptor of the French work remains anonymous, but a second stone group acquired in 1938, of Istrian origin, has the distinction of being attributed to a known sculptor, Pietro Lamberti (c. 1393–1435), who was active in Florence and Venice in the late 1300s and early 1400s. Pietro was the son of Niccolò Lamberti (c. 1370–1451), creator of one of the figures of the Four Evangelists that embellish the façade of the Florence cathedral. Niccolò's St. Mark, dating from 1415, shows the lingering influences of the International Gothic style, which was then being supplanted in Florence by the emerging style of the Early Renaissance. The newer style was already evident in two other figures for the cathedral, Nanni di Banco's St. Luke, and more signifi-

cantly Donatello's powerful and imposing St. John. Niccolò departed from Florence for Venice in 1416 to work on the sculptural decoration of St. Mark's basilica. His son Pietro, who is recorded in Florence in 1410, was also active in Venice and its environs until his premature death in 1435.

The move to Venice and the surrounding Veneto allowed Niccolò and Pietro, as practitioners of a style quickly becoming *retardataire* in Florence, to become, as art historian Sir John Pope-Hennessy has observed, part of the mainstream in the history of sculpture in the north of Italy. Pietro Lamberti's recorded sculptural works in this new ambience include the 1423 tomb of Doge Tommaso Mocenigo, in Venice's church of S. S. Giovanni e Paolo, and the Fulgosio tomb erected between 1429 and 1431 in the Santo at Padua. Stylistic comparisons between the ROM's Istrian stone group

IN THE RELIEF PANEL OF THE DORMITION
OF THE VIRGIN, CHRIST HOLDS THE
VIRGIN'S SOUL, REPRESENTED AS A TINY
CHILD-LIKE FIGURE IN HIS ARMS

Opposite page: *St. Anne, the Virgin and Child*, N. German (Lübeck), early 16th century, oak relief. The sculpture has been attributed to Claus Berg or his workshop.
Below: Crucifixion (left) and Dormition of the Virgin (right), German, 14th century, ivory.



and the various details of the figure carving for the Mocenigo and Fulgosio tombs leave little doubt as to its attribution, and suggest a date for it between those of the two tombs. The Lamberti attribution was clinched in the 1980s by American scholar Anne Markham Schulz, whose studies of Pietro Lamberti's oeuvre provided a wealth of photographic material for comparison. She included the ROM sculpture in her major monograph on the Lamberti, published in Florence in 1986, and dated it to shortly before 1429–1430. In spite of its late date, traces of Late Gothic style and influence remain. It is a transitional work, evolving towards a newer style while retaining features of the older.

Also active in the double orbit of Florence and Venice were the workshops of Baldassare degli Embriachi, specializing in carved and inlaid sculptures of wood and bone. Works were produced between the

opening of the Florentine atelier in 1389 and the closing of the Venetian branch in 1433. The Embriachi specialty was small reliefs made from strips of carved bone set into wooden frames. The workshop made decorative caskets, altarpieces, mirror frames, and, most notably from the number of surviving examples, small triptychs. One of these forms a significant part of the ROM's collection of Late Gothic sculpture and for purposes of iconographic study is particularly fascinating. It relates to a broad group of similar triptychs frequently dated to the 1390s.

In this bone triptych (shown on page 26), the imagery of St. Mary the Virgin is that of the Mater Dolorosa, the sorrowing mother at the foot of the cross. On the insides of the two hinged doors, which open out on either side, are representations of various saints—on the right, St. Peter and St. Paul, and below them, St. Bartholomew and

HOW TO RECOGNIZE A SAINT

THE SAINTS WERE POPULAR FIGURES in Medieval art and most can be recognized by their symbols, clothing, and other attributes. Here are the clues to the identities of the saints in the ROM's Embriachi triptych.

St. Leonard is clad in a dalmatic, the liturgical vesture of a deacon, and holds fetters in his hands. The fetters distinguish him from other deacon-saints such as St. Stephen Protomartyr, who is often shown holding or wounded by a stone or stones, and St. Lawrence, whose distinguishing emblem is a gridiron. St. Bartholomew, held by tradition to have been flayed, is shown holding a large knife, and St. Anthony Abbot, one of the more charming Medieval saints, is recognizable by his habit, his staff (usually "T" shaped), and his little pet pig!

St. Peter is easily recognized by his two keys, and since Sts. Peter and Paul are frequently shown together, the bearded figure with a sword next to him is quickly identifiable as St. Paul. St. John the Baptist wears a coat of camel hair. St. James Major is usually garbed as a pilgrim, with a pilgrim's staff and hat bearing a cockleshell motif. St. Francis of Assisi and St. Dominic are more difficult to distinguish as both are friars. St. Francis usually bears stigmata, marks that are difficult to distinguish in a small scale.

Triptych, Italian,
c.1390, bone and wood.
Embriachi workshop.



St. Anthony Abbot; on the left, St. Francis of Assisi (or St. Dominic?) and St. Leonard at the top and below them St. James Major and St. John the Baptist. These various religious men are identifiable by their symbols and attributes (see "How to Recognize a Saint," this page). The armour seen in the Crucifixion scene is of late-14th-century type. The soldiers wear helmets with pointed skulls, a type known as *bascinet*. The north of Italy, specifically Milan, was one of Europe's greatest production centres for quality armour, and it is hardly surprising that the masterpieces fashioned by Milan's armourers should be reflected in an Embriachi triptych.

The Baptism scene below that of the Crucifixion shows Christ standing in the waters of the river Jordan, which are rendered by an envelope of raised wavy lines. This stylized treatment is a holdover from Byzantine iconography dating to as early as the 5th and 6th centuries as seen in the mosaics of the Orthodox and Arian Baptistries in Ravenna.

Recent ROM research has uncovered evidence for the attribution of another of the Museum's Late Gothic sculptures to a known region and workshop. The wooden relief of St. Anne with the Virgin and child (shown on page 24) was acquired by the ROM in 1962. Formerly thought to have been of south German origin, dating from the late 15th century, it in fact dates from the early years of the 16th century and is of distinctive north German type. The relief is of oak, and is close in style to a range of wood carvings associated with the city of Lübeck in the late 1400s and early 1500s.

The figure of St. Anne, at the left of the piece, wears a type of hood or "Haube" in a style common in north German sculpture of the early 1500s. This garment was subject to regional variation, with distinctive types emerging during the 1400s. The *Haube* in the ROM's relief is similar to one depicted in a scene of the Lamentation of Christ from the Heide Altar of c. 1515 in Schleswig-Holstein and to others in a Holy Kindred panel of c. 1515 recorded in the collection of the St. Annen Museum in Lübeck. The Lübeck panel derived from the Lübeck Burgkirche, or town church.

In the ROM piece, the depiction of the Christ child with large head and spindly limbs has parallels in the Lübeck Burgkirche relief, in a Late Gothic group of the Virgin and child from an altarpiece of c. 1520-1530 in Lübeck's Heilig-Geist Hospital, and in Benedickt Dreyer's lost Virgin and child of 1510-1520 from the Lübeck Marienkirche. (Though the Dreyer group was

RECENT ROM RESEARCH HAS UNCOVERED EVIDENCE FOR THE ATTRIBUTION OF ANOTHER OF THE MUSEUM'S LATE GOTHIC SCULPTURES TO THE WORKSHOP OF CLAVS BERG

destroyed in 1942, its appearance is preserved in photographs.) Further stylistic evidence linking the ROM relief with Late Gothic sculpture in Lübeck is provided by its drapery style. The angular, sharp-edged folds are very like those seen not only in Lübeck sculpture of the early 1500s in general, but specifically in the works of the sculptor Claus Berg.

The similarities are evident in a comparison of the ROM sculpture with Berg's All Saints Altar of c. 1520 from the St. Knudskirche at Odense, and with the apostle figures carved for the cathedral at Gustrow around 1530. Not only is the ROM relief clearly produced within the realm of north German Late Gothic wood sculpture, it is close enough in style to the works attributed to Claus Berg to consider it as a probable product of his workshop. The neckline of the Virgin's dress, the high waistline, and the sleeve divided at the elbow all indicate a date early in the 16th century. The details reinforce the impression that the ROM relief was created around 1515–1520.

Two other sculptures in the ROM's collections, each of them an ivory panel carved in relief (shown on page 25), may also have a German origin. Such works were designed as the leaves of sculptural diptychs used for devotional purposes. One of the panels depicts the Crucifixion, the other the Dormition of the Virgin, also known as the Death of the Virgin. Both are similar to French examples, and reveal the same iconographic features as French ivories, but slight differences in the treatment of architectural and figural detail have suggested to several authorities that they are more likely to have been carved in Germany, possibly in the Rhineland.

The relief panel of the Dormition of the Virgin portrays Mary on her deathbed surrounded by the apostles. In the centre is Christ holding the Virgin's soul, which is represented as a tiny child-like figure in His arms. This manner of representing Mary's death is of considerable lineage, and occurs in Byzantine mosaics, wall paintings, and icons.

Albeit small, the ROM's collection of Medieval sculpture in various media is an admirable microcosm of the art of the Middle Ages, and allows the visitor to make connections that may be pursued in an ever-broadening circle of reading, study, and travel. By learning about the artwork of Medieval Europe, we can begin to understand something of the faith, the time, and the place in which they were created. ⇐

DEATH AND THE MEDIEVAL MAIDEN

THE END OF THE MIDDLE AGES in Europe was occasioned by an astonishing wealth of artistic creativity in the midst of terrible crisis. In the mid 1300s anywhere from a third to a half of the population was carried off by plague. The 1300s and early to mid 1400s saw France devastated by the horrors of the Hundred Years War. Social convulsion and economic chaos was accompanied by an all-too-obvious breakdown of established order. A spirit of deep cynicism for the present and a sense of nostalgia for the past emerged on many fronts, typified by an emphasis in the visual arts and literature on the triumph of death and the transitory nature of all earthly things.

The theme of *Sic transit gloria mundi* ("So passes the glory of the world") found poignant expression in the lamentations of Medieval poets ranging from the "*Ubi sunt qui ante nos fuerunt?*" ("Where are they who came before us?") of an anonymous late-13th-century English writer, to François Villon's "*Mais où sont les neiges d'antan?*" of the 1400s. Icons of human mortality—melancholy and macabre—proliferated, from the weepers of Late Medieval tombs to the effigies on the tombs themselves of the deceased as rotting cadavers. One such image ornaments the tomb of Cardinal Jean de la Grange, who died in 1402 and was buried at the church of St. Martial in Avignon.

Out of this mournful procession at the close of the Middle Ages appeared a significant class of ivory carvings, the "*memento mori*." It included large rosary beads made in France and the Netherlands with contrasting depictions of the living and the dead. A single example in the ROM's European collections is a French rosary bead of c. 1500 showing a young woman's portrait in relief on one side, and a rotting skull accompanied by worms and toads on the other. A date of c. 1500 is indicated by the features of the woman's headdress. The skull, or death's-head, is a memento of the ephemeral nature of earthly pomp and vanity, an admonition from the past to the present: "What you are, I once was! What I am, you will become!"



Rosary bead, French, c. 1500, ivory.

The large bone in the background is part of the upper jaw of a duckbilled dinosaur. On the far left in the foreground is a crocodilian armour plate. The long tooth belongs to a tyrannosaur, and next to it on the right is a smaller armour plate. The bone on the far right is part of a dromaeosaur vertebra.

BRIAN BOYLE, ROM

hunting for dinosaurs in

The Kyzylkum Desert of Uzbekistan may yield the



it's noon, and the thermometer on my backpack has already climbed to 40°C. With my Russian colleagues Alexander Averianov, Igor Danilov, and Anton Revnyi, and American palaeontologist David Archibald, I huddle under a wind-battered, blue plastic tarp—the only shade for miles. It's time for a quick lunch of delicious local watermelon, and a brief siesta; it has simply become too hot to search for dinosaurs in the sun-

tamerlane's **b**ackyard

By Hans-Dieter Sues

precursors of North American dinosaurs

Soviet Palaeontologists had found dinosaurian remains in the Kyzylkum that were many millions of years older than those found in Alberta and Saskatchewan

drenched badlands of Uzbekistan's Kyzylkum Desert.

The vast Kyzylkum, one of the largest deserts in the world, is named for the reddish hue of its sands. Since the 19th century, occasional reports by geologists and travellers have mentioned dinosaurian bones from the Cretaceous rocks of this area. David and I are the first Western palaeontologists permitted to work here. The remote expanses of what was formerly Soviet Middle Asia offer enormous, still largely untapped opportunities for palaeontological exploration. Uzbekistan was one of the southern republics of the Soviet Union and remained largely off-limits to foreign scientists until 1991 when the country reluctantly declared its independence.

In the late 1970s, Lev Nesson, a young Russian palaeontologist at Leningrad (now St. Petersburg) State University, visited the Kyzylkum Desert to search for fossils near a tiny settlement called Dzharakhuduk (which, in the Kazakh language, means "well on the escarpment" in reference to a local watering hole). He would hitchhike from Leningrad to Uzbekistan and then hike from the nearest road. His aim was to recover fossils of the small mammals that had lived in the shadow of the dinosaurs.

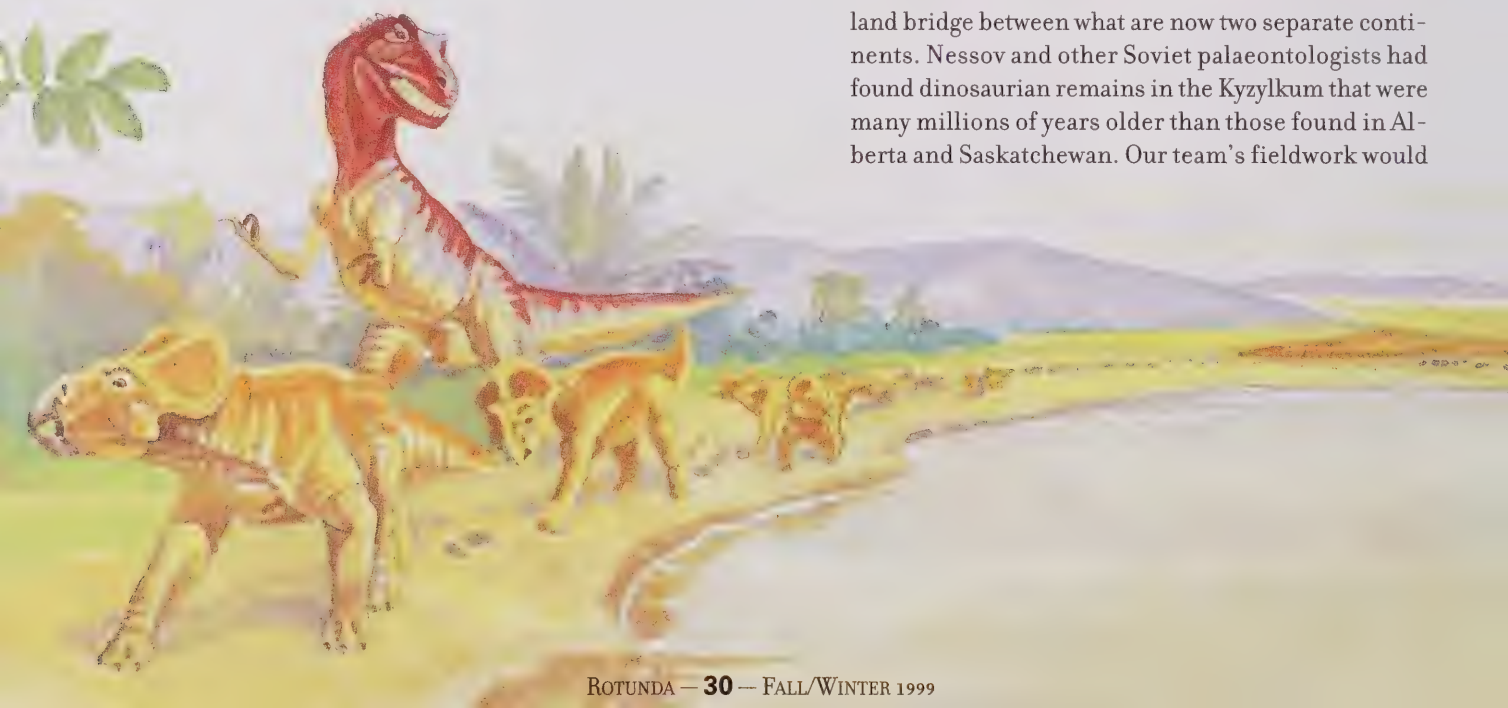
When Nesson started his work, fossils of Cretaceous mammals were known only from the Gobi Desert of Mongolia and from western North America. What he found at Dzharakhuduk exceeded every palaeontologist's wildest dreams—countless tiny bones and teeth of mammals, birds, frogs, salaman-

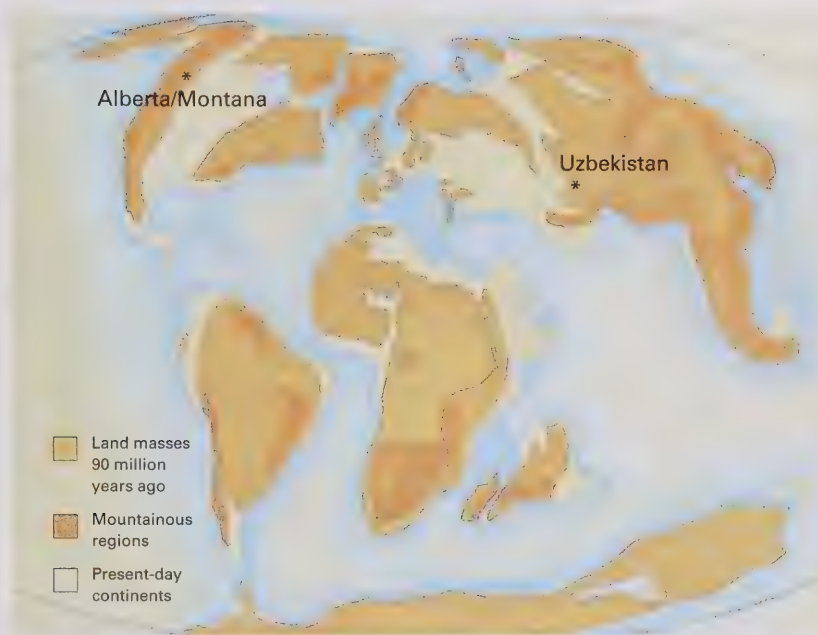
ders, and lizards as well as wonderfully preserved remains of turtles, crocodilians, dinosaurs, and flying reptiles (pterosaurs). Nesson thought these diverse communities had lived on a coastal floodplain early in the Late Cretaceous, some 85 to 90 million years ago. The many shark teeth that were found indicated the presence nearby of a large sea at that time. Some of the fossils he recovered closely resemble those of early hoofed mammals (ungulates). Because such mammals were not known from strata of this age in other parts of the world, some Western researchers questioned the accuracy of his age determination.

After reading several of Nesson's papers I became excited at the prospect of travelling to the Kyzylkum to hunt for dinosaurs. I had for many years been interested in the assemblages of Cretaceous dinosaurs of Central Asia because of their potential to explain the evolutionary origins of the geologically younger dinosaurs found in western North America. Those who study dinosaurs have long been impressed by the similarities between Asian and North American species during Late Cretaceous times. More recently, several palaeontologists have also observed that a profound change took place in the composition of North American dinosaur communities during this same period, some 90 million years ago. At that time, various lineages first appeared in North America: duckbilled dinosaurs (hadrosaurs), horned dinosaurs (ceratopsians), and the predatory giants of the family Tyrannosauridae.

Scientists hypothesize that these groups evolved in Asia and arrived in western North America across a land bridge between what are now two separate continents. Nesson and other Soviet palaeontologists had found dinosaurian remains in the Kyzylkum that were many millions of years older than those found in Alberta and Saskatchewan. Our team's fieldwork would

MARIANNE COLLINS





MARIANNE COLLINS

Map of the world about 90 million years ago. The dark areas indicate land. They are superimposed on lighter areas indicating present-day continents.

test the hypothesis of dinosaurian dispersal from Asia.

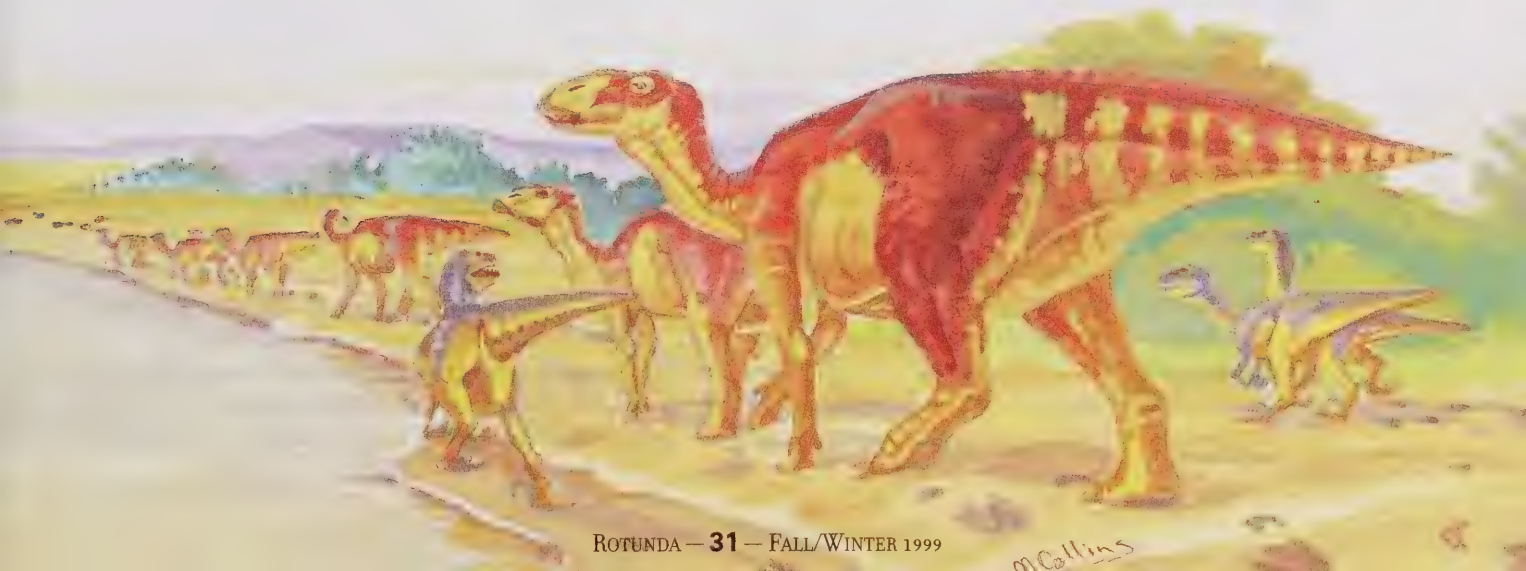
My involvement in the project began in 1992 when I contacted Nesson and learned that he and an American specialist in Cretaceous mammals, David Archibald, from San Diego State University, had already set up a joint field-research program. They invited me to join them as the team's dinosaur specialist. Shortly thereafter, the shock of Nesson's sudden and untimely death cast doubts on the project's future. Fortunately, his former student Alexander "Sasha" Averianov carried on his fieldwork and agreed to collaborate with us. David and I were able to obtain permission from the Uzbek Academy of Sciences to conduct fieldwork, and we secured funding from the National Geographic Society and other granting agencies.

Finally, in September of 1997, we set out for the Kyzylkum. At Tashkent, we met Sasha and two of his students. We had also recruited two British experts: David Ward, a private scholar and leading authority on fossil sharks, and Chris King, a veteran field geologist who was to help determine the age and formation of the fossil-bearing rocks. Both were former field companions of mine who had many years of experience conducting geological research in some of the world's most inhospitable places.

Operating in a desolate location poses numerous logistic challenges. Through the help of a local environmental activist

named Oleg Tsaruk, we were able to retain the services of a retired Russian geologist, Boris Veretennikov. Boris came to Uzbekistan as a young man and fell in love with the stark beauty of the Kyzylkum Desert. He now lives in Tashkent, the nation's capital. He agreed to serve as our outfitter and guide. His rugged Soviet-era jeep, outfitted with reserve fuel tanks and a trailer, will traverse any terrain. Unfortunately, the vehicle is devoid of even the most elementary comforts, such as shocks. A crack car mechanic, Boris also proved to be a great camp master and resourceful cook who managed to create tasty meals for us, despite rather limited local resources: mutton, mutton, or mutton.

A two-day drive took us first to Samarkand, a large city renowned for its magnificent 15th-century buildings from Timur's (Tamerlane's) reign. It was then on to the regional capital, Navoi, with its drab Soviet-style highrises, and finally to the former centre of Soviet



fossil Collecting in this kind of environment begins with crawling around on the ground, picking up bones that have been exposed by the relentless action of the wind



uranium production, Uchkhuduk. There, we bought various food supplies and loaded up on fuel before setting out for the fossil-hunting grounds.

I will never forget hobbling out of Boris's jeep and into the brilliant midday sun at Dzharakhuduk after a long, bumpy ride across the desert. We set up camp at the base of the escarpment and, despite the noon-time heat, were eager to have a look at the exposures along and on top of the escarpment. There were already chunks of dinosaurian bone where I pitched my tent!

David Archibald and the Russian team members were mainly interested in collecting small vertebrates, especially mammals. We located Lev Nesson's most productive sites and started amassing a large collection of fossils while David Ward and Chris King began detailed mapping of the geological formations.

Fossil collecting in this kind of environment begins with crawling around on the ground, picking up bones that have been exposed by the relentless action of the wind. The surface was littered with thousands of fossil bones, mainly of fish and salamanders. They were so well preserved that they almost could have passed for those of animals that had died recently. Occasionally, a team member would find a mammal jaw fragment with teeth, which was always cause for much excitement. We also found teeth and the delicate bones of various dinosaurs and pterosaurs. Later, as we dry-screened the crumbly rocks around us, we recovered an even richer crop of small bones and teeth. At some sites, the surfaces were covered with large dinosaurian bones and bone chunks. As in western

Canada, those of duckbilled dinosaurs vastly outnumbered the bones of all other kinds of dinosaur.

Our finds confirmed Nesson's earlier observations. We had uncovered the bones of hadrosaurs, several kinds of predatory dinosaurs, large sauropods, and rare ceratopsians and ankylosaurs. The hadrosaurs were primitive forms that lacked the elaborate skull crests found in many North American members of this group, several beautiful examples of which are on display in the ROM's Dinosaur Gallery. The hadrosaur teeth already closely resemble those of later species, but the tightly packed tooth "batteries" in each jaw contained fewer teeth, indicating that the Asian species represented an earlier evolutionary stage than those from western Canada.

The predatory dinosaurs included a tyrannosaur and a sickle-toed dromaeosaur. The Dzharakhuduk tyrannosaur differs from its North American relatives in its smaller size and in its teeth with their compressed, blade-like crowns. Nesson believed it to be related to the still poorly known tyrannosaur *Alectrosaurus* from Mongolia. The dromaeosaurs are distinguished by the presence of a huge, sickle-shaped claw on the second toe; the group includes *Velociraptor*, the non-human star of the movie *Jurassic Park*. Judging from several bones (including an incomplete sickle-shaped claw) collected by our team, the Dzharakhuduk dromaeosaur was considerably larger than the two-metre-long *Velociraptor*.

One of the common North American groups, the horned dinosaurs of the family Ceratopsidae, is represented by rare skeletal remains of one or two small



Far left: View of the “petrified forest,” a group of peculiar tubes once thought to represent petrified trees. The origin of these structures is as yet unknown. Above left: The 1997 field crew. On the ground in front are team leaders David Archibald (left) and Hans-Dieter Sues (right). Above: Fossil-bearing rocks are exposed near the top of the cliffs in this view of the escarpment at Dzharakhuduk. The field camp was located on the sparsely vegetated plain at the foot of the cliffs. Above right: British team-member David Ward proudly shows off a vial full of tiny bones and teeth of Cretaceous vertebrates.



species. This is the first definite record of ceratopsids from Asia. Sauropod dinosaurs, which include the largest land animals of all time, were rare in North America during the Late Cretaceous but very common on the southern continents. Surprisingly, we found a number of sauropod bones and teeth at Dzharakhuduk.

The dinosaurs from Uzbekistan show a number of similarities to the geologically younger dinosaurian communities from western North America, supporting the hypothesis that the latter may have immigrated from Asia. However, many of the species from Dzharakhuduk are known from only a few bones. We need to collect more specimens before we can determine the specific affinities of these animals to North American forms.

As I noted earlier, some Western scientists had questioned Nesson’s estimate of the geological age of the fossil-bearing rocks at Dzharakhuduk. He had argued that these strata dated from the Turonian and Coniacian stages of the Cretaceous period, some 85 to 90 million years ago. This would have made them several million years older than the classic dinosaur-bearing rocks of western North America, which date from the Campanian and Maastrichtian stages of the Cretaceous. The presence of the ungulate-like mammals seemed inconsistent with such an ancient date, as palaeontologists had previously assumed that they evolved only at the end of the Cretaceous.

Using micro fossils, Soviet researchers have now

dated the marine rocks beneath the dinosaur-bearing strata at the base of our escarpment as Turonian. Therefore, the dinosaur-bearing layers could not be older than Turonian, our lower age limit. However, we initially had no means to determine an upper age limit. Fortunately, Chris King discovered a thin bed of marine limestone above the dinosaur-bearing beds near the top of the escarpment. This rock layer proved to be full of fossils belonging to more than 80 species of invertebrates, predominantly clams and snails.

Preliminary identification of these fossils suggests that the limestone belonged to the Coniacian or Santonian stages of the Cretaceous, about 83 to 89 million years ago. Thus, the rocks containing the dinosaurs and mammals were at least 83 million years old, but almost certainly older. Nesson had been right all along! We toasted his memory with a rather potent mixture of the local “technical” vodka and Coca-Cola, which, luckily, is ubiquitous in Uzbekistan. (I had lost about 30 pounds by drinking water from the local well.)

The Cretaceous sedimentary rocks at Dzharakhuduk still contain countless fossils, silent witnesses to the diverse ecosystems that flourished along the western shores of the large landmass that comprised much of Asia and western North America some 90 million years ago. The team members are eager to return to the bleak, windswept expanses of the Kyzylkum to learn more about this lost world. As Stephen Graham wrote in his memoir *Through Russian Central Asia* (1916), “Once you have become a companion of the road it calls you and calls you again . . .” ■

An Ancient and Distinct Culture

The Essential

Photography by Brian Boyle

辛丑五月二十日
山人時列



Korea

By Wonyoung Koh and Hugh Wylie

Inspired by a rugged and mountainous terrain intersected by more than a dozen rivers, Koreans describe their country as "an embroidery of rivers and mountains, spun in silk." Borrowed from the work of artisans, the image also reflects the nation's cultural life, time-honoured and dynamic, which itself has been woven with the fabric of a rich and varied history.

Korea's peninsular position in Northeast Asia—between the Yellow Sea and the East Sea—has given it the role of cultural intermediary between neighbours China and Japan, but Koreans have long viewed themselves as occupants of a distinct geo-political entity. The Korean peninsula was inhabited from as early as 700,000 to 600,000 years ago, although by peoples whose relationship to later Koreans is still unclear. Scholars have suggested that distinct Korean ethnicity and culture first emerged about 1200 to 1100 BC when the area's Neolithic inhabitants began to interact with newly arrived peoples who possessed bronze technology.

Respect for scholarship and learning has from ancient times been a hallmark of Korean culture. Early in the country's history, interest in communicating ideas led to the production of high-quality paper and ink, and later to the development of printing technology. Woodblock printing was already in existence in Korea in the 8th century, and movable metal type was invented and in use several centuries before Gutenberg designed Europe's first printing press.

The indigenous Korean alphabet, called Han'gŭl, was devised almost 700 years later by an academy of

scholars assembled by King Sejong (r. 1418–1450) and promulgated to the Korean people by royal decree in 1446. The object of considerable national pride today, the Han'gŭl writing system was scientifically developed to suit the Korean spoken language and to permit literacy among those who lacked the time and resources of the elite to learn classical Chinese.

Confucianism, as a model for righteous government, and Buddhism, as a spiritual font, were also instrumental in shaping Korean thought, and both continue to influence its citizens today. Over the centuries, the native Korean religion, shamanism, has been a subtle spiritual presence. Its primordial power has infused religious philosophy and ritual introduced from abroad with a distinctly Korean sensibility.

But fine ceramics are perhaps Korea's highest achievement. The country's history echoes through the patterns of its art. The powerful stoneware pottery style of the Three Kingdoms period (57 BC–AD 668) is based in the ancient indigenous culture. Buddhist sculptures and metalwork of the Unified Silla (668–935) are products of devotion to Buddhism, the guiding principle during the period, and the refined and serene celadon wares of the Koryŏ dynasty (918–1392) are also imbued with Buddhist philosophy. Porcelain wares of the Chosŏn dynasty (1392–1910) are clear reflections of the moral attitude of the Neo-Confucian scholar-gentlemen of the day—puritanical simplicity and disdain for excessive artistry.

What makes Korean art so compelling is its desire to accord with nature. This aesthetic is evident especially in the ceramics of the Chosŏn period, where functionality was informed by an unpretentious spontaneity. Modest in form, these vessels rely for their beauty on undisguised natural materials and on decoration that even in intricate detail is harmonious and simple. In these fine works, landscape, history, and culture meet and speak softly yet eloquently about the whole of Korean life.

In the following pages, explore Korea's art, history, and technology through highlights from the Museum's recently opened Gallery of Korean Art.

On September 11 the ROM's new permanent Gallery of Korean Art opened, fulfilling a long-term commitment of the Far Eastern Section of the Department of Near Eastern and Asian Civilizations to present to the public a more complete story of the cultures of East Asia and to display more of its superb Asian collections. The objects in the new gallery represent approximately 8000 years of Korean history and cultural achievement, from the Neolithic period to modern times.



God of Smallpox and His Wife (Shamanistic Deities)

*Painted in ink and colour on paper, mounted on panel
Chosŏn dynasty (1392–1910), late 19th – early 20th century*

Length: 109 cm, width: 59 cm

*Donated by George J. M. Gale in memory of his father,
the Reverend James S. Gale,
Presbyterian missionary in Korea, 1888–1927*

Considered to be portraits of shaman spirits, nature deities, and human spirits, the figures in shamanist paintings almost always take human form. In the above image, the “god of smallpox” (Pyŏlsang) is portrayed as a military leader with his wife. Although shamanism is a belief system indigenous to Korea, the earliest recorded paintings date only to the Koryŏ dynasty. Painted on scrolls that are either hung or pasted directly on the wall above the shaman’s altar, more than 134 distinct deities appear in works owned and sanctified by 20th-century shamans. When placed in the shrine, they mark the presence of divine spirits and gods; they are not merely displayed, they are revered. The stern images represent deities associated with a particular shaman and are summoned during the *kut*, or shamanistic ritual.

Similar in style and in their brilliant palette to Korean Buddhist painting, shamanist works were quite often commissioned from professional Buddhist painters historically, although most contemporary shamans employ inexpensive commercial prints. The exceptional skill and use of costly materials such as the gold leaf in this example may be directly related to the popularity of shamanism in Seoul during the final days of the Chosŏn dynasty. Queen Min (1851–1895) was notorious for her patronage of shamanism. She had shamanist shrines built near her palace and regularly supported various shamanist rituals.

The Essential Korea

Jar, Entitled *Dream*, by Sin Sangho (Shin Sang-ho, b. 1947)

Punch’ŏng stoneware, 1998

Height: 35.7 cm, width: 33.5 cm, diameter: 33.5 cm

Gift of the artist



The most striking features of *punch’ŏng* ware of the early Chosŏn dynasty (1392–1910) were its aesthetic decoration, free spirit, and abstract patterns, which resonate remarkably well with 20th-century audiences. The various slip-decorated techniques employed in traditional *punch’ŏng* ware were unrestrained and the potter’s involvement was clearly observable.

Dean of the College of Fine Arts at Hong’ik University in Seoul, Sin Sangho is one of the most successful ceramists working in Korea today, making vessels, tiles, and large sculptures in porcelain, celadon, and *punch’ŏng*. The jar shown here represents Sin’s latest experimentation in *punch’ŏng* style.

Some 30 years ago, Sin began his study of *punch’ŏng* ware, giving him an uncommon understanding and command of the techniques. In his new works he adopts a painterly style that uses traditional *punch’ŏng* techniques such as the sgraffito applied on the surface of this simply shaped wheel-thrown jar. In creating such works he employs a fine, dark iron-rich clay. Applying a slip when the pot is leather-hard, he draws his images—here animals in a bush—using a sharp bamboo blade. His knife is swift and spontaneous, evoking Buddhist painting of the Sŏn (Zen) sect, as it reveals areas of the dark clay body through the white slip. To achieve multiple layers of intricate colour within the slip, Sin is said to fire his pots twice, changing the firing method as required. His works epitomize tireless and creative experimentation in traditional techniques to achieve a personal style that appeals to contemporary sensibility.



Lobed Cup and Stand with Chrysanthemum Design

*Stoneware with celadon glaze, inlaid in sanggam technique
Koryŏ dynasty (918–1392), late 12th – early 13th century
Total height: 14.3 cm*

Since its purchase in 1924, this exquisite celadon has been the most-often published work from the Museum's Korean collections. Its aesthetic qualities place it near the pinnacle of similar pieces in Western collections. The vessel and stand were probably used to serve ritual tea in a Korean Buddhist monastery.

The inlaid-slip technique used on this piece is called *sanggam*, which became the prevalent method for decorating Koryŏ celadons. Potters likely were inspired by Koryŏ craftsmen's highly developed expertise in inlaid metalwork and mother-of-pearl inlaid lacquerware. Requiring the utmost care, the process called for a slip stable enough to remain firmly imbedded in an incised elaborate design. A thin, translucent glaze revealed the decoration beneath. *Sanggam* decoration represented a new aesthetic, probably related to the shift in political power from civil to military leadership after about 1170. Incised and carved decoration can also be seen on the cup and stand.



Standing Buddha, on a Lotus Dais

*Gilt-bronze
Unified Silla period (668–935), 8th century
Height: 21.5 cm
This acquisition was made possible with the generous assistance of the Louise Hawley Stone Charitable Trust*

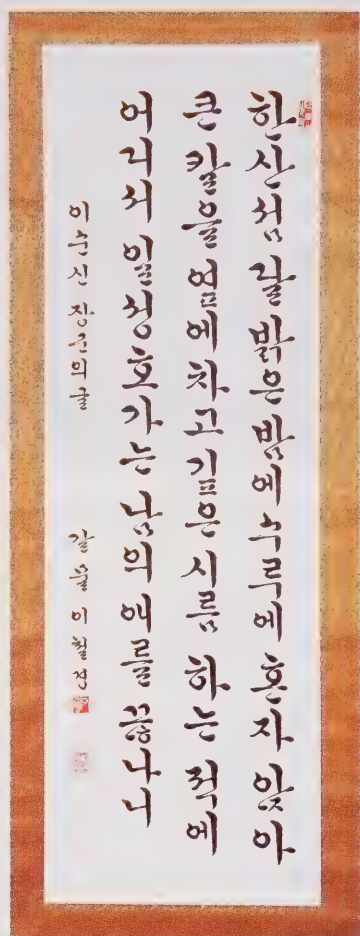
Icons of the Buddha and figures from the Buddhist pantheon are the most compelling of art forms in the service of Buddhism, a world religion central to the thought and culture of East Asian civilizations. This gilt-bronze Buddha image, complete with an octagonal pedestal with two rows of lotus petals, is a good example from the Unified Silla period (668–935). Its well-proportioned body is draped in the King Udayana style, referring to the legendary First Image of the Buddha. After Enlightenment, the historical Buddha is said to have ascended to the Heaven of the Thirty-three Deities to preach to them and to his mother, Maya. But his absence from Earth distressed his royal convert, King Udayana. To console the king, a life-sized image of the Buddha was sculpted from sandalwood. With some variations, the Udayana type is characterized by folds of the robe draped from both shoulders in large concentric arcs in front of the chest and abdomen, and outlining of the thighs with similar concentric flowing lines.

This Buddha's shaved head is topped with an *usnisa*, or rounded protrusion, symbolizing his supreme wisdom. Korean metalwork images of Buddhas produced during the Three Kingdoms and Unified Silla periods were cast using the "lost-wax" method. Like most other contemporary images, this one is missing its mandorla, or large halo, that originally backed the sculpture, attached by a peg on the Buddha's back. The mandorla would have hidden a large cavity resulting from the lost-wax technique.

By moonlight I sit all alone
 In the lookout on Hansan Island.
 My grand sword slung at my side,
 my spirit deeply troubled.
 From somewhere the shrill note of a pipe
 cuts into my heart.

**Han'gŭl Calligraphy by
 Kalmul (Yi Ch'ŏlgyŏng,
 1914–1989)**

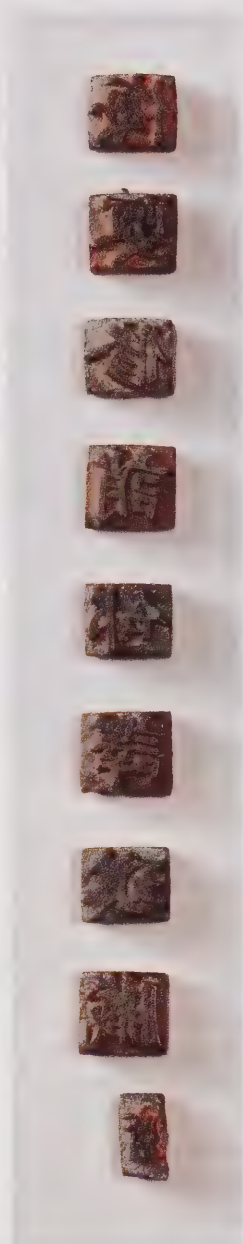
*A lyrical poem, "Hansan
 Island," by Admiral
 Yi Sunsin (1545–1598)
 in kungch'e (semi-cursive
 court calligraphic style)
 Hanging scroll,
 ink on paper
 Dated 1985
 With mounting:
 height: 180.4 cm,
 width: 47.1 cm
 Gift of Key Seok Seo,
 the artist's son*



The Korean phonetic writing system, Han'gŭl, was invented in the 15th century, but it wasn't until the late 19th century that it gained general acceptance. Over the past 50 years, Han'gŭl calligraphy has developed into a major art form. A leading proponent of this movement was eminent artist Yi Ch'ŏlgyŏng, more commonly known by her art name, Kalmul.

Her *kungch'e*, or court-style calligraphy, seen here was based on a study of surviving examples brushed by court ladies of the Chosŏn dynasty (1392–1910). Such works are primarily diaries and letters, which stayed within the royal palace compounds, written in Han'gŭl rather than Chinese characters. Chinese was used for all official documents and scholarly writing of the period. The intimate and personal manuscripts demonstrate a distinctive calligraphic style—supple, spontaneous, and feminine. Kalmul developed this nascent mode of Han'gŭl writing into a full-fledged and widely accepted calligraphic style. Her work is renowned for its elegance and gracefulness.

In this example she records a poem by Admiral Yi Sunsin, the most esteemed military leader in Korean history, whose strategy turned the tide of war in favour of the Korean troops during the Japanese invasions of 1592 and 1593.



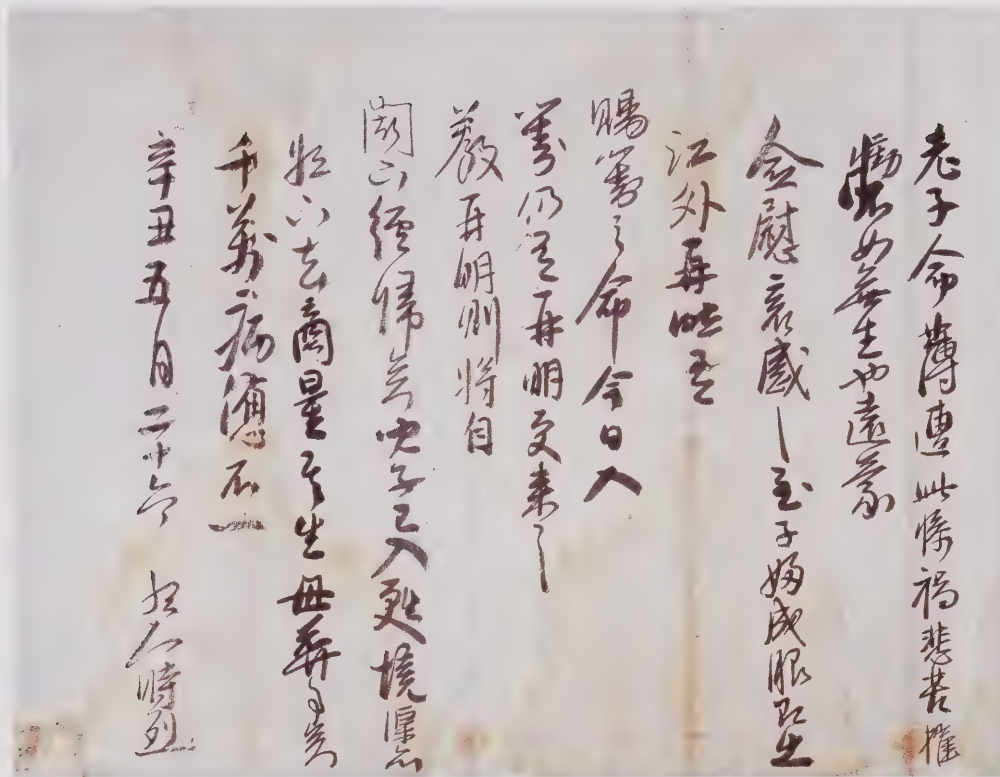
Movable Metal Printing Type

*Copper-alloy bronze
 Chosŏn dynasty (1392–1910),
 probably 18th century
 Dimensions of largest: height: 1 cm,
 width: 1.2 cm, depth: 0.3 cm*

Surviving examples of movable metal type from Korea—where it was invented in the 13th century—are rare. These type blocks from the Royal Ontario Museum's collections represent the Chinese-character typeface style called Kapinja, named for the traditional calendar name of the year it was first cast: 1434. Kapinja was the third typeface cast in metal during the Chosŏn dynasty. The initial casting produced about 200,000 different characters in two sizes. Its aesthetic qualities are linked to the personal taste of King Sejong, and among all the available

styles, it became his preferred typeface.

Kapinja adds cursive elements to the Chinese character form called standard script. Scholars of the time had immense interest in the physical appearance of published books and developed a high degree of sophistication in their connoisseurship of typefaces. Although the original 1434 Kapinja was followed by the casting of other typeface styles, it was so favoured that new sets were recast six times between 1515 and 1777. Specialists can distinguish the various castings of Kapinja type, and the ROM's examples are thought to be from the 1772 or 1777 recastings.



Correspondence by Song Siyöl (1607–1689)

Calligraphy in ink on paper

Chosŏn dynasty (1392–1910), dated the fifth month of 1661

Height: 26.5 cm, width: 33.7 cm

Gift of Professor Jae-man Song

This personal letter was written by Song Siyöl (pen name Uam), one of the most influential Confucian scholars and politicians of the Chosŏn dynasty. Serving in various government posts through the reign of four kings—from King Injo (r. 1623–1649) to King Sukchong (r. 1674–1720)—Song was leader of the Old Doctrine faction, a political group of scholar-officials. Throughout his lifetime he was involved in numerous internecine disputes during the most intense period of such strife. His is the only name to appear more than 3000 times in the 888-volume *Annals of Chosŏn*, attesting to his major role in the politics of his time. He became a successor within the Korean Kiho School of Neo-Confucian doctrine, to whose teachings he contributed.

Also well known for literary compositions and calligraphy, Song first studied the work of famed Chinese calligrapher Yan Zhenqing (709–785), but it was not until after he researched the calligraphy of Zhu Xi (1130–1200) that he developed a unique personal style characterized by strong brushwork, reflecting his high moral character.

From 1659, Song had been involved in a quarrel over the appropriate mourning rites to be observed by Queen Cha'ui upon the death of her husband, King Hyojong. This ideological dispute precipitated political strife that lasted several decades and caused the downfall of many people, eventually including Song himself. He was attacked by various opponents, one of whom was Yun Sŏndo (1587–1671), a government official and famous poet, who submitted a controversial memorial to the king accusing Song of disloyalty to the deceased Hyojong. Although Song continued to enjoy the confidence and support of King Hyŏnjong (r. 1659–1674), at the time he composed the letter shown here he must have been experiencing a difficult period in his life; the letter alludes to misfortunes in his household.

The Essential Korea



**Shallow Dish with Stamped Decoration
and Government Office Mark (Naesöm)**

Punch'ong stoneware

Chosŏn dynasty (1392–1910), 15th century

Height: 3.5 cm, diameter: 15.1 cm

Gift of Mrs. George G. R. Harris

Some of the most beautiful *punch'ong* ceramics are those decorated with stamped designs. In this technique, decorative patterns—chrysanthemum flowers, “raindrops,” and other motifs—were stamped on a leather-hard ceramic body. The stamped surface was brushed with slip to fill the impressed design and then wiped to remove any excess. The vessels were covered with clear glaze and fired. As this decorative style developed, the impressed designs became more compact. Some of the most elegant *punch'ong* ware is in

this style. Stamped designs sometimes include the names of various government offices. The marks were designed to prevent unauthorized use by others. The “Naesöm” impressed on this example refers to the office in charge of supplying food and textiles to the palace, officials of the second rank and higher, and visiting foreign officials. *Punch'ong* vessels marked “Naesöm” are thought to have been produced in Chŏlla Province, where most shards with that mark have been found.



Pedestalled Bowl with Cover

Domed cover impressed with geometric designs

Three Kingdoms period, Kaya, 5th century

Total height: 21.5 cm

Stoneware of the Silla Kingdom (57 BC–AD 668) and the Kaya Federation (AD 42–562) began to appear in Korea during the 4th century, evolving from the earthenware type that had previously existed in the region. Usually bluish-grey non-porous stoneware, these ceramics are fired in temperatures over 1000°C. Except for smaller pieces, the walls of the vessels were strengthened by beating and their final forms were shaped on the potter's wheel. Kaya vessels may broadly be divided into two geographical groups, reflecting the divide of the Nakdong River. Pots from the region west of the river are more distinct from Silla versions. Kaya pedestalled dishes, a shape that dates



Storage Jar and Circular Base

Natural-ash glaze

Three Kingdoms period, Silla/Kaya, 5th century

Height: 17.2 cm, base diameter: 12 cm

Gifts of the Canadian Association for the Recognition and Appreciation of Korean Arts (CARAKA) in memory of its founder, Dr. Tai Yun Whang

from the Bronze Age, typically feature trumpet-shaped pedestals bearing vertically aligned perforations. Though ceramic production appears to have been a highly specialized industry, Silla and Kaya tombs yield prodigious quantities of such wares. Recent archaeological finds at early residential sites suggest that these wares were also used in everyday life. The most common vessel shapes are pedestalled bowls and high-necked jars, but the silhouettes of Silla and Kaya stoneware can be quite diverse. They are strong and archaic in form and surface, yet very freely executed.

The Essential Korea

Lidded Box (*Ham*)

Black lacquered wood with mother-of-pearl inlay
Chosŏn dynasty (1392–1910), 17th – 18th century
Length: 70.8 cm, width: 37.8 cm, height: 25.5 cm

Gift of Mrs. George G. R. Harris



Seen in Korean lacquerware from ancient times, the highly evolved decorative technique of mother-of-pearl inlay was especially prevalent during the Koryŏ dynasty (918–1392). Artisans of modern Korea continue to produce exquisite lacquers with this same technique. Thinly cut and polished abalone shell is set into a black lacquer ground, endowing it with varied and subtle iridescent blues and pinks.

This box is decorated with stylized peonies, traditional symbols of wealth and honour. Similar peony scrolls are found embellishing *punch'ŏng* stoneware and porcelain of the early Chosŏn period, but the motif was particularly favoured for inlaid lacquerware throughout the Koryŏ and Chosŏn dynasties. In Koryŏ times the design was tightly packed, but during the Chosŏn the same motif exhibited bold and simplified forms with flat, broad petals and leaves. The scrolling became much larger and was applied sparingly, as seen in this example. In the later Chosŏn, particularly from the 19th century, the peonies were replaced by the Ten Symbols of Immortality (the sun, mountains, rocks, water, clouds, turtles, cranes, deer, pines, and fungus) and other auspicious symbols.

By the late Chosŏn, mother-of-pearl inlaid lacquerware boxes (*chagyeham*) were considered essential, though luxurious, items for the woman's room (*anbang*). This *ham*, like some of the large chests, would have been used for storing clothes.

This outstanding piece of metalwork with its delicate repoussé depiction of phoenixes, dragons, ducks, and chrysanthemums is typical of the Koryŏ dynasty (918–1392). The period saw a continuation of highly developed works in gold and silver, a characteristic component of the art of the earlier Three Kingdoms period (57 BC–AD 668). The early metalwork functioned as personal adornment and this silver knife sheath may have attached to the wearer's costume by means of a small loop near the top of the sheath, though it is now broken off.

The sheath is similar to other surviving Koryŏ examples both in decoration and in the long, tubular form which bulges slightly towards the top and tapers at both ends. It was formed by soldering together two identically decorated vertical halves. Decorative motifs are grouped in seven horizontal sections, with phoenixes in the upper band and ducks in the lower. Celestial dragons writhing against a background of clouds are repeated in two central sections, each of which is separated by a floral band of the ubiquitous chrysanthemum, which so often decorates Koryŏ celadons. Much of the sheath's surface is textured with a fine mesh pattern, which creates a delicate play of light.

Knife Sheath

Silver

Koryŏ dynasty (918–1392),
12th century

Length: 21.6 cm

Gift of Sir Robert Mond





GODDESSES AND STARS

A Photographic Tour of the Universe

Gabriele Vanin

(*Firefly, Paper: \$24.95*)

ASTRONOMY HAS BEEN CALLED the oldest science, and indeed primitive man and woman must have been awestruck by the mystery and power of the pre-Edisonian night sky. Telescope technology continues to extend visual access. Compared with Galileo's earliest "through-a-glass-darkly" optics, the colossal Keck I Observatory at Mauna Kea, Hawaii—and the wandering Hubble—offer an angel's-eye view of the cosmos. Astrophotography captures and preserves the view. Italian astronomer Vanin chronicles celestial observation through the ages and unveils a gallery of astro-photographic masterpieces, from the pyrotechnic Trifid Nebula to the majestic Andromeda Galaxy.

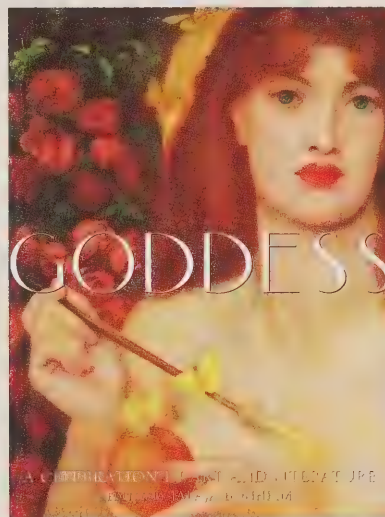
Into the Dinosaurs' Graveyard: Canadian Digs and Discoveries

David Spalding

(*Doubleday Canada, Cloth: \$34.95*)

CANADA IS THE REPOSITORY of more than 50 classes of dinosaur remains, most of these (36) situated in the world's richest deposit area, Alberta's Dinosaur Provincial Park, the source of more than 250 dino skeletons. (An evocative archival photo shows the ROM's palaeontology team in these "badlands" in the 1920s). Spalding tells the story of Canada's dinosaurs and their hunters, the country's leading role in dinosaur science, and the thriving "cultural industry" it has spawned. The Royal Ontario Museum is a major player, and its achievements over the 20th century are well represented—from William Arthur Parks and Levi Sternberg to Chris McGowan and Hans-Dieter Sues.

FEATURE REVIEW



Goddess: A Celebration in Art and Literature

Edited by Jalaja Bonheim

(*Stewart, Tabori, and Chang, Cloth: \$81*)

THE VOLUPTUOUS Pre-Raphaelite girl/woman on the cover suggests that *Goddess* might be a Rossetti/Waterhouse/Millais potpourri, a Victorian dreamscape inhabited by pulchritudinous English girls, floating—as Ophelia—on a stream of flowers, or as the lovely-faced Lady of Shallott, drifting prettily to many-towered Camelot.

The word "goddess" itself, once reserved to denote a female deity, today connotes at least as much sexuality as spirituality. On that basis, Bonheim's exploration of this icon's role in world culture is doubly ambitious, unifying the goddess as body *and* spirit. Appropriately, the Rossetti cover girl (Victorian actress Alexa Wilding) exhibits a halo—a luminous cascade of gold—backlighting her auburn mane.

Goddess explores a vast range of world mythology to reveal the infinite manifestations, the shapes and guises, of the goddess figure. Patterns emerge to verify the connectedness of the human experience over time and space. Goddesses of love, for example, are always bathed in golden light—and associated with water, flowers, and gold. The garments of sky goddesses are, not surprisingly, universally blue.

A counterpoint of mythology and art, *Goddess* is also a visual feast, a model of design, a mirror of the goddess in her numerous forms, from Ocean Child to Earth Mother.

COMPILED AND REVIEWED BY GLEN ELLIS

the Flight to Quality

Personal wealth. It's a growing reality for many Canadians. Yet, time, complex tax legislation and an ever-changing world keep people from managing their financial affairs. In today's world, wealth management is a full-time role effectively conducted by a professional — who has the time, training and support to be successful.

At the Equion Group, we understand these realities. And we have responded, since 1980, by building wealth management services that are sound, effective and based on proven principles. We have brought together experienced professionals, from a variety of disciplines, who have significant experience in satisfying financial goals. They will help you define goals and set clear directions... to create and preserve wealth.

Let us help you with your wealth creation, preservation and management.

Call Rob Pierce at: 1-800-565-4605

Or visit our website at: www.equion.com

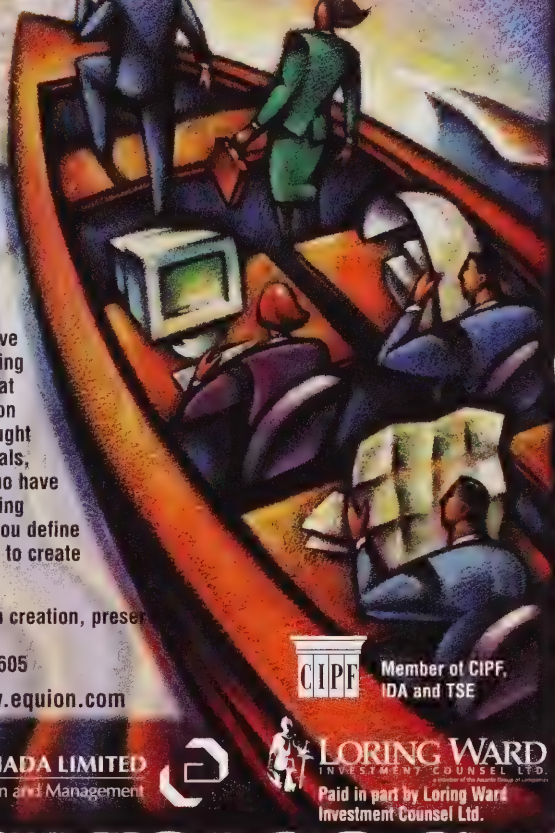
EQUION SECURITIES CANADA LIMITED
Wealth Creation, Preservation and Management



Member of CIFF,
IDA and TSE



LORING WARD
INVESTMENT COUNSEL LTD.
Paid in part by Loring Ward
Investment Counsel Ltd.



The Oxford Dictionary of Literary Quotations

Edited by Peter Kemp
(Oxford University Press,
Cloth: \$52.50)

THE WRITTEN WORD—from the ancient world to the present—is the inspiration for this trove of quotables. They speak for themselves: "All Rome is mad about my book. It's praised, they hum the lines, shops stock it." (Martial, c. AD 40–104); "Tell it not in Gath, publish it not in the streets of Askedon, lest the daughters of the Philistines rejoice." (Bible: II Samuel); "The love that moves the sun, and the other stars." (Dante Alighieri, 1265–1321); "More than kisses, letters mingle souls." (John Donne, 1572–1631); "There is no language like the Irish for soothing and quieting." (John Millington Synge, 1871–1909); "Go in for Celtic, lad, there's money in it." (Joseph Wright, 1855–1909, advice to the young J. R. R. Tolkien); "Last night I dreamt I went to Manderley again." (Daphne DuMaurier, 1907–1989).

A History of the Twentieth Century Volume Two: 1933–1951

Martin Gilbert
(Stoddart, Cloth: \$50)

SIR MARTIN GILBERT's monolithic ten-volume biography of Sir Winston Churchill set new standards for the biographical word. Similarly, his "trilogy of the century" promises to be the definitive survey. The first volume concluded with the rise to power of FDR in America and of Adolph Hitler in Germany. This second instalment, a melancholy panorama, illuminates the road to war, a tragedy of errors advancing inexorably to the monstrous events of 1939–1945. A chronicle of the destructive power of nations, it is ultimately, however, a tribute to the value and dignity of life, to family bonds, and to humanity's capacity for renewal and regeneration. This just may be Martin Gilbert's finest hour.

Glen Ellis is head of Publications,
Royal Ontario Museum

COMING IN THE SPRING 2000 ISSUE

ROTUNDA

Where the Wild Things Are

Dr. Mark Engstrom looks at
the nature of biodiversity.





IDENTIFYING MALLORYTOWN GLASS

How to distinguish old Ontario glass from modern Mexican look-alikes

Dear ROM Answers,

SOME YEARS AGO at an old local estate auction, I purchased a small glass pitcher, measuring 8.5 cm (3¼ inches) tall. Its cylindrical body tapers inward toward the top, then flares out slightly below the rim. The spout was pulled forward while the glass was hot and a "C"-shaped handle was applied to one side. It is obviously hand-blown with a rough pontil mark on the bottom. During its manufacture, the glass-blower carefully folded over the rim, to round the edge.

The glass was blown in a mould, imparting narrow convex ribs that swirl diagonally around the sides. The glass itself is pale green with a slightly bluish cast and has numerous small bubbles and occasional bits of opaque white in it that look almost like lint. Dirt has accumulated around the lower edge of the folded rim and where the handle joins the body. The handworkmanship, the glass, the age of the estate, and the dirt all suggest to me that it is an old piece. Because I purchased it in southeastern Ontario where the Mallorytown Glassworks operated, I have always thought that it originated there.

Jamie Sherman, a professional glass-blower from Muskoka, recently spoke on Mallorytown glass at a local museum. He had created a reproduction of the Mallorytown "lily pad" pitcher that came from the Bates family for the Reproduction Shop at the Royal Ontario Museum.

Based on its technique and the type of glass, Mr. Sherman thought my tiny pitcher was made at Mallorytown. What do you think?

M. L., BROCKVILLE, ONTARIO



Dear Reader,

Several similar enquiries about Mallorytown glass have come in during the last year. Perhaps now is a good time to review the details about this glass, especially as the Royal Ontario Museum holds the world's largest collection.

PETER KAELLGREN

Canadiana enthusiasts consider Mallorytown, a village to the west of Brockville, Ontario, to be the place

Top: Mexican hand-blown glass like these examples of c.1920–1970 is sometimes mistaken for Mallorytown glass. M. L.'s pitcher is in the centre. Above left: Lily pad pitcher. Above Right: Covered sugar bowl. Both are blown and tooled glass attributed to Mallorytown, Ontario, c. 1939/40.

where Canada's glass industry began. According to local tradition, supported by a small number of articles that have been passed down in local families, a glass house operated there

www.cjrt.fm

91.1 CJRT FM

CLASSICAL & JAZZ RADIO TORONTO

**The Home
of
great
Classical
&
Jazz
music
on
Toronto
Radio!**

www.cjrt.fm

91.1 CJRT FM

CLASSICAL & JAZZ RADIO TORONTO

briefly in the 19th century. An account published in the Brockville newspaper *Our Cheerful Friend* on April 1, 1879, states that among his many business ventures, Mr. Amasa W. Mallory operated "a glass factory during 1839 to '40, which closed owing to the unreliableness of the foreman."

The late Gerald Stevens, one of the first writers on early Canadian glass, discovered the site in a farmer's field a mile west of Mallorytown in 1953 and spent half a day ploughing up its remains. Stevens found raw glass-making materials, chunks of melted glass, and shards of worked glass. Although the material did not clearly indicate the volume of production, Stevens suggested that bottles were the factory's primary output, with a small quantity of household wares being made on an occasional basis. Stevens discovered no written evidence and found no coins, ceramics, or metals on the site that could help to establish the period of operation.

During the 1800s, glassworkers travelled widely in search of work, and the craftsmen and technology employed at Mallorytown most likely came from the United States. The glass closely resembles pieces attributed by scholars of early American glass to the Redwood Glass House in New York State. Exactly what happened at Mallorytown and what was manufactured there remains something of a mystery.

The type of glass that is attributed to Mallorytown, however, is no mystery. Surviving pieces are hand-blown in a fairly thick and clear glass the colour of an aquamarine gemstone. Although the glass contains some bubbles and spots of unmelted opaque white material from the batch, it is essentially clear. The pieces have pontil marks at the bottom. Some pieces, such as the bulbous pitchers and a covered sugar bowl in the ROM's collections, have a "lily pad" pattern around the lower side, which frequently embellished blown glass made in America during the early 1800s. Glass threads are coiled around the necks of some pitchers.

Forms associated with Mallorytown resemble American wares produced about 1825-1850. They include pitch-

Maya Universe Programs and Events

Slide Talks

Tree of Life

Mexican potter Tiburcio Soteno
and arts and crafts specialist
Chloë Sayer

**6–8:30 p.m. Tuesday,
November 2**

\$9/\$7 members, students & seniors (P253)

Understanding Maya Glyphs and Reading the Maya Universe: New Developments

With Maya Universe curator
Dorie Reents-Budet

**6:30–9:00 p.m. Tuesday,
November 9**

\$14/\$12 members, students & seniors (P255)

The Yucatan Connection

With Canadian master craftsman
Michael Fortune

1–3 p.m. Sunday, November 13

Free with admission (P256)

Lords of Tikal: Maya Royal Court

With author and archaeologist
Peter Harrison

7–8:30 p.m. Tuesday, November 16

\$9/\$7 members, students & seniors (P257)

Family Day

Weavers, potters and musicians will
introduce you to Maya Universe.
The whole family can enjoy hands-
on activities, music and food. Meet
members of the Maya community,
plus the curators and archaeologists.

**1–4 p.m. Sunday, October 31 &
Sunday, November 28**

Free with admission

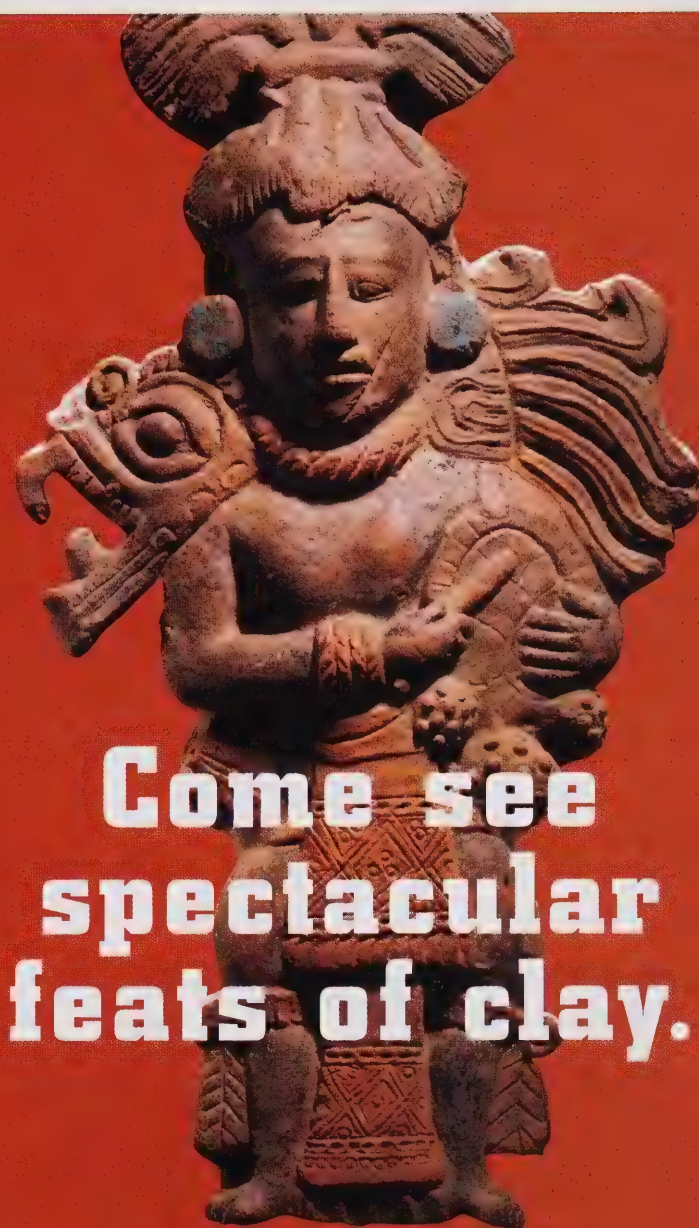
For more information please call
416 586-8080 or visit
www.gardinermuseum.on.ca

Museum Hours

Monday to Friday 10 am to 7 pm
Saturday 10 am to 5 pm
Sunday 11 am to 5 pm

Museum Admission

\$3 students & seniors
\$5 adults, \$12 families
FREE ON FIRST TUESDAY OF EACH MONTH
Free year round for Gardiner Members.



**Come see
spectacular
feats of clay.**

MAYA

UNIVERSE

SEPT. 9th – JAN. 2nd

Proudly presented by



Whistle figurine of a dancer playing a turtle carapace drum.
Guatemala, AD 650-800
Collection: Gardiner Museum
Photo: Frank Tancredi.

**THE GARDINER MUSEUM OF CERAMIC ART
(Right across from the ROM)
CALL 416 586-8080**

Media Partners

CLASSICAL 96.3 FM

THE GLOBE AND MAIL

ers, low bowls, dishes, sugar bowls with domed covers, flat oval flasks, tumblers, and cylindrical jars. Mallorytown glass is rare and seldom offered for sale.

I do not think that your pitcher was made at Mallorytown for a number of reasons. First, the colour and texture of the glass are different from Mallorytown pieces. It closely resembles glass made in Mexico, which frequently has many tiny bubbles, an oily appearance like some types of hair gel, and a rough pontil mark. The Mexicans continue to follow basic traditional blowing and tooling techniques in their glass work, often using discarded bottles as a source of material. This results in Mexican glass frequently being confused with glass produced in the United States and some European countries about 1775–1850.

Secondly, the pattern of narrow swirling ribs is typical of Mexican glass, and is created in a mould. It does not appear on glass attributed to Mallorytown. In *The Canadian Collector* (Ryerson Press, 1957), Gerald Stevens

states specifically that "Not one of the shards... indicates that Mallorytown workmen made use of moulds."

Finally, your pitcher follows the so-called tankard shape that was introduced about 1865–1880. All of the known Mallorytown pieces are functional items of glassware. Your pitcher is a novelty or giftware form. Quantities of Mexican glass have been sold as gift and decorator wares in Canada since the 1920s. This glassware was featured as part of a notable Spanish art show at the Canadian National Exhibition in 1928 and is often found in older households and estates. Thank you for sharing your pitcher with our readers. Even though it is not Mallorytown, it has considerable educational value.

Peter Kaellgren is curator in the ROM's Department of Western Art and Culture, specializing in British and European decorative arts from 1500 onwards. Peter's column "ROM Answers" originally appeared in City and Country Home from 1982 to 1992.

If you own furniture, silver, glass, metalwork, ceramics, textiles, or small decorative objects that may have an interesting past and have aroused your curiosity, this column is for you. Send a clear colour photograph (or 35-mm colour slide) of the object against a simple background, providing dimensions, a description, any markings, or any known details of its history to: ROM Answers, c/o **Rotunda** Magazine, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario M5S 2C6. Be sure to enclose a stamped, self-addressed envelope large enough to include any photos that must be returned to you.

Neither Rotunda nor the author nor any other person who may be consulted assumes any legal responsibility for these opinions or their ramifications. No financial appraisals will be offered. If your query is selected to be published in the column, only your initials and city will appear, in order to protect your privacy. Letters will be acknowledged as staff time permits.



The Gardiner Museum of Ceramic Art

111 Queen's Park, Museum Subway Station, Toronto, Ontario

American Ceramic Circle Symposium

November 5 - 6, 1999

A rare opportunity to hear lectures of the American Ceramic Circle, an organization that promotes the study of ceramics. Fifteen distinguished artists, scholars and collectors from Europe, Canada and the United States will cover an array of topics such as "*Ottoman Influence on European Ceramics*" and "*The Reconstruction of the China Rooms at Kensington Palace and Hampton Court Place*."

Includes opening reception at the Gardiner Museum and lunch each day.

\$170 Gardiner or ROM Members; \$190 general public.

For more information please call 416 586-8080 or visit www.gardinermuseum.on.ca



The Twelve Trees of Christmas

Celebrate the holiday season by visiting Toronto's favourite Christmas exhibition. Toronto's finest designers honour the 20th century by creating trees commemorating "*The Best of the Century*." Gala will be held on Wednesday, November 24, 1999, 6-10 p.m. at the ROM.

Tickets \$150. Call 416 586-8080 for tickets.

Exhibition runs November 25 through December 16, 1999 at the Gardiner Museum. Exhibition free with admission.

Proceeds from the Twelve Trees of Christmas support the acquisition and exhibition fund at the Gardiner Museum.

Presenting Sponsor:

BURGUNDY
ASSET MANAGEMENT LTD.

Media Partners:

CLASSICAL 96.3
FM

THE GLOBE AND MAIL
CANADA'S NATIONAL NEWSPAPER • FOUNDED 1854



CROSSING THE CULTURAL DIVIDE

Combining Eastern and Western approaches may be the best recipe for lacquer conservation

AS AN M.A. STUDENT visiting from the Victoria and Albert Museum, I am at the ROM to further develop my specialty in furniture and wood conservation, in particular to learn more about Asian lacquer from Marianne Webb, the Museum's decorative arts conservator, who is an internationally renowned expert in this material.

Unlike European lacquers, which are complex mixtures of spirit- or oil-based varnishes developed to imitate its effect, true Asian lacquer is exuded directly from a few tree species that grow across Asia. After it is collected, refined, and processed, the lacquer is brushed in many layers onto a substrate, most often wood. Final decoration, such as sprinkled gold or silver, inlay of mother-of-pearl, or a design carved into the lacquer itself, may be added before the lacquer hardens to a luminous finish.

A material of many contradictions, Asian lacquer when wet is highly toxic, causing severe skin irritation, although once dry it is safe enough to eat from. New lacquer coatings are resistant to acids, but after exposure to sufficient light, they become so vulnerable that a fingerprint may become etched indelibly into the surface, or a colour change wrought by a single drop of water.

Most museum objects made with Asian lacquer have been light-damaged over the years and pose many challenges for the conser-



MARIANNE WEBB, ROM

ROWAN CARTER

vator. Flaking or missing areas of lacquer, patchy matte surfaces, broken edges, and crude or failing restora-

Above: Brushstrokes that are seen clearly in this Asian lacquer repair on a suit of Japanese armour cannot be removed because of the lacquer's irreversibility. Top: The ROM's 18th-century Japanese palanquin was restored in 1990 using reversible methods of conservation.

CLASSICAL 96.3 FM
TORONTO

CLASSICAL 103.1 FM
EASTERN ONTARIO

Every week,
over **400,000** people
listen to
**THE SOUND
OF A DIFFERENT
DRUMMER.**

tions are typical. As a student learning how to treat these problems, being exposed to alternative treatment methods is an indispensable experience. Until recently, approaches to Asian lacquer have been polarized into two camps. At the ROM and many other Western museums, lacquer is

conserved using materials that differ from the original so that they may be easily identified. Such materials are also invariably reversible to ensure that, should they fail, they can be removed, and should future materials be considered more appropriate, the object can be retreated.

ASIAN LACQUER THE CONSERVATOR'S DILEMMA

ONE OF THE fundamental tenets of conservation is the reversibility of treatments, the belief that any repair made to an object should be removable without causing damage. This concept was developed through years spent by many conservators trying to undo the work of others. Numerous artifacts have been devalued or destroyed by overzealous cleaning and poor-quality repairs. Indeed, much of the ROM's conservation time is spent removing disintegrating old repairs and replacing them with more suitable ones.

In conserving Asian lacquerware, as with all other materials, Western conservators follow this central principle. The approach taken in the Eastern world, however, is less familiar. In Asia, lacquerware has traditionally been repaired with the same material used on the original. *Urushi* (lacquer) is considered by the Japanese to have an immeasurable spiritual quality. Therefore, making repairs with lacquer itself is appropriate for both physical and metaphysical reasons.

Putting aside the reversibility argument for the moment, using Asian lacquer for conservation has its merits. As a consolidator and adhesive it has been used successfully for many centuries. Certainly it stands up favourably to the test of time. Lacquer works well to stabilize distorted, crumbling, and brittle surface areas. And there is no worry about a dissimilar material having a detrimental effect on the original

lacquer. In practical terms, it can be applied without any adverse effects on the surface, and when thinned with solvents soaks into the ground layers, providing a good bond to the core of the object.

These advantages are considerable, yet re-lacquering cannot successfully be accomplished by most conservators. Because mistakes cannot be corrected, new lacquer applied by an inexperienced hand may only add to an object's poor state of repair. Such results are in evidence throughout the world. It takes many years of training simply to choose the proper type and appropriate amount of lacquer for a particular job. Without this expertise, the risks are too high for most conservators. Aside from the health hazards of working with wet lacquer, retouched areas also age at a different rate from the original, making repairs increasingly visible over time. This problem is evident in the photograph of the Japanese suit of armour from the ROM's collections.

Although I can appreciate the benefits of using true Asian lacquer for repairs, without extensive training in the fine art of lacquering I will continue to use the reversible conservation methods that I have developed over almost two decades at the ROM.

Marianne Webb is the Museum's decorative arts conservator and author of Lacquer: Technology and Conservation.

This contrasts with the approach taken in the East, where repairs are usually made with more lacquer. Despite its irreversibility, new lacquer remains compatible with the original surface, and as long as the repairs are executed by a skilled conservator, the need for their future removal should be negated. Eastern conservators must undergo many years of training in the art of lacquering before treating important artifacts.

My stay at the ROM to learn about practical Western techniques is the first stage of my research. In October, I embark on the second, with a three-month sojourn in Japan to learn the basics of traditional lacquering and to investigate the Japanese approach. I do not know yet which set of techniques I will adopt, but from my experience thus far, it is already clear that neither is perfect. There are advantages and disadvantages to both (See "Asian Lacquer: The Conservator's Dilemma," page 50). A combination of approaches would offer the most options for treatment and allow the individual needs of a particular object to be addressed more fully.

Fifteen years ago this proposition would not have been possible. But today, relations between lacquer conservators from the East and West are closer than ever before. An arena of mutual respect and an established forum for discussion bode well for the art of lacquer conservation. Only the future will show how far the cultural traditions will merge.

Rowan Carter is a second-year M.A. student visiting from the Conservation Department of the Victoria and Albert Museum in London, England.

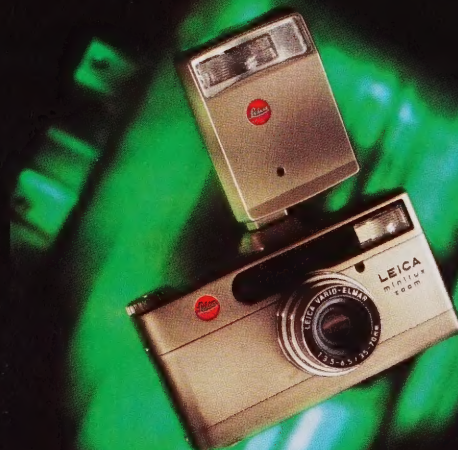
If you are interested in learning more about the best techniques to care for both Asian lacquer and European japanning, look for Marianne Webb's book *Lacquer: Technology and Conservation*, available from Butterworths-Heinemann in November.

*Luxury in the
palm of your
hand*



LEICA minilux zoom

The Leica minilux zoom is an elegant top model in the class of high quality 35mm viewfinder cameras. With its completely new 7-element Vario-Elmar f/3.5-6.5/35-70mm lens it provides superb images and high speed in a robust titanium body. Features include automatic film threading, auto film wind/rewind, active autofocus from 70 cm to infinity, program-controlled exposure and much more. Available with an optional CF-14 Flash Unit (shown) to expand your creative possibilities as it overrides the built-in flash.



For a colour brochure and the name of the Leica dealer nearest you, contact:

**KINDERMANN
(Canada) INC.**
(Leica Camera Division)

361 Steelcase Rd. West, Unit #3,
Markham, ON L3R 3V8
Tel.: (905) 940-9262 • Fax: (905) 479-9755
E-mail: kindrman@istar.ca
Website: www.leica.kindermann.com

Classical presentation with cutting-edge style

**Our catering services are available for your
social, society, residential, corporate,
charitable, fundraiser events**

We lead in the field of professional caterers

For your next event



call (416) 971-4068

79 St. George Street, Toronto, Ontario

Our Cafe Now Open at the George R. Gardiner Museum of Ceramic Art,
111 Queen's Park, Toronto, Ontario

Wednesday – Saturday, 11:30 – 3:00 pm;

for reservations please call (416) 586-8080

www.alacartekitchen.com • info@alacartekitchen.com

DANCING WITH MAGIC

... On the scene in 1950s Toronto



ROM ARCHIVES

APASTIME OF KINGS and noble-
men, masked balls have also
graced the halls of the Royal
Ontario Museum. Pictured here, the
soirée held in February 1959 opened
the exhibition *Masks—The Many Faces
of Man*. A number of guests designed
their own fanciful facewear for the
occasion, embracing the themes of
transformation, ritual, concealment,

JULIA MATTHEWS

protection, and decoration that were
also illustrated in the catalogue—ele-
gantly designed by Frank Newfeld—

accompanying the show.

Left: Mrs. Nathan Phillips, wife of
Toronto's mayor, is greeted by the
ROM's Chairman of the Board of
Trustees, Mr. Harold Melvin Turner,
in fantastic headgear, and Mrs. H. M.
Turner, in butterfly mask. Right: Dr.
Carlton Coon of the University Muse-
um, Philadelphia (at far left), opened
the exhibition. Beside him, the ROM's
director, T. A. Heinrich, wel-
comes a masked guest to the ball.

*Julia Matthews has been head of
the ROM's Library and Archives since
1983. Her special interests are museology
and the history of the ROM.*

If you remember such an occasion at the ROM, or an exhibition that has stayed with you
across the years, send us your reminiscences at info@rom.on.ca.



World Companies Fund

**"Investing in companies
that are revolutionizing
the way the world works,
plays and lives."**

Chris Jenkins

Portfolio Adviser, World Companies Fund
Rothschild Asset Management

For an information package on the
World Companies Fund,
contact your financial professional,
call Global Strategy at 1-800-387-1229,
or visit www.globalstrategy.com

**GLOBAL
STRATEGY**
INVESTMENT FUNDS

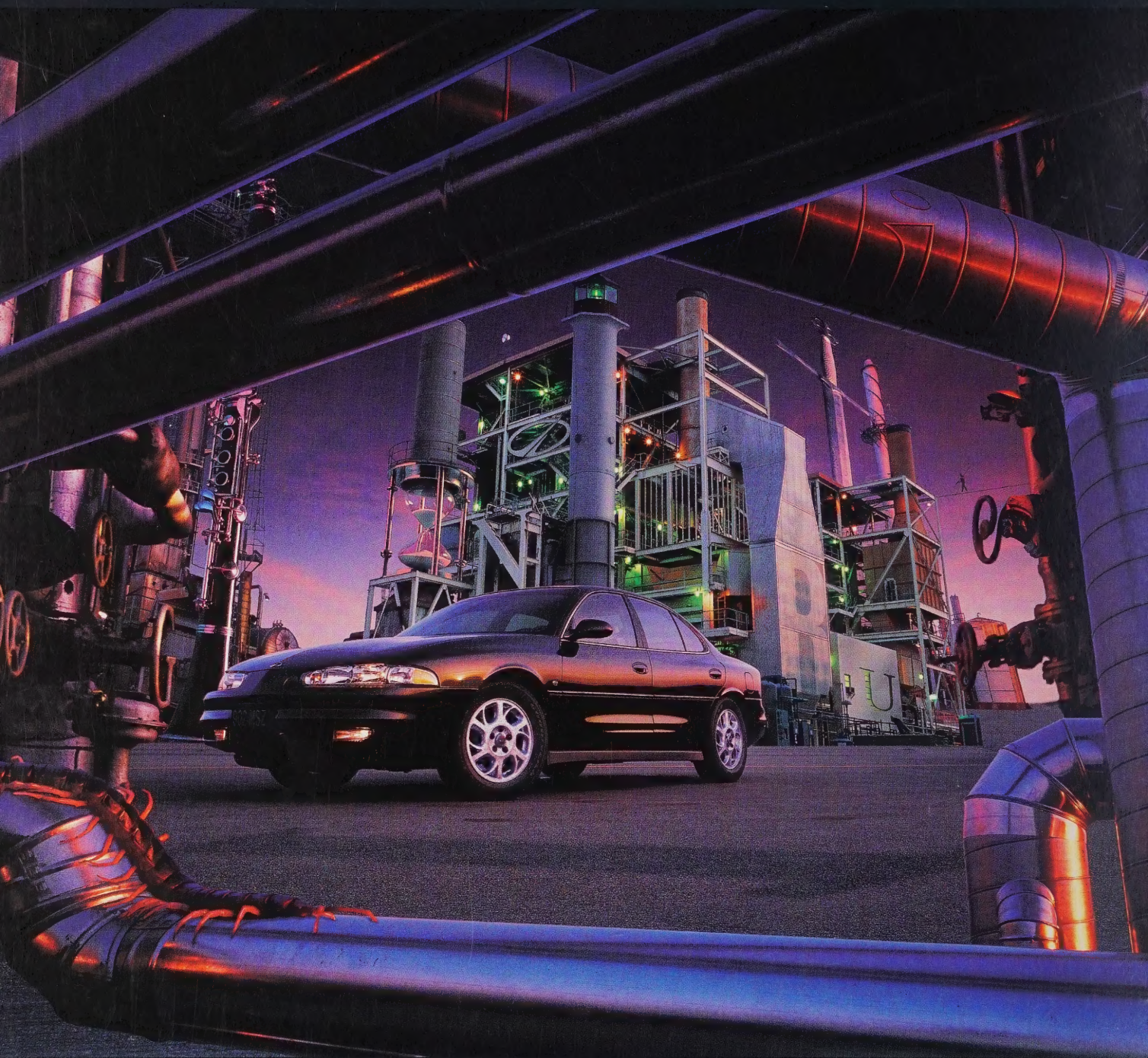
**KIDS HELP PHONE
1 800 668 6868**



Global Strategy is proud to be an
official sponsor of Kids Help Phone

Important information about the Global Strategy World Companies Fund is contained in its simplified prospectus. Obtain a copy from your broker, investment fund dealer or Global Strategy and read it carefully before investing. Past returns are not necessarily indicative of future returns. Investment returns and unit values will fluctuate. Mutual funds are not CDIC-insured. This information is not and should not be construed as investment advice to any party. Investment advice should be obtained from a broker or dealer. In addition to Rothschild, the adviser for the Fund is Montgomery Asset Management.

Global Strategy is a trademark of Global Strategy Financial Inc.
Global Strategy is an associate of the N. M. Rothschild group of companies.



WHERE DOES ONE FIND THE TRUE ORIGIN OF POWER? IT'S HIDDEN DEEP WITHIN AN ALL-NEW 215 HP TWIN CAM ENGINE. AN ENGINE THAT WILL ENTICE YOU TO THE TYPE OF ROAD WHICH WILL PAY IT TRUE JUSTICE. FOR THE FIRST TIME EVER, THIS AWARD-WINNING 3.5 LITRE V6 ACCOMPANIES A HIGH-PERFORMANCE SUSPENSION THAT WILL HAVE YOU CRAVING THE KIND OF CORNERS **INTRIGUE** YOU CAN REALLY SINK YOUR TIRES INTO. INTRIGUE. AS ALWAYS, IT'S WHAT **by Oldsmobile** YOU DON'T SEE THAT WILL ASTONISH.

For more information, visit our web site at www.gmcanada.com or call 1-800-GM-DRIVE.

START SOMETHING